Motivated Monitors:
The Importance of Institutional Investors' Portfolio Weights[☆]

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Abstract

Studies of institutional monitoring focus on the fraction of the firm held by institutions. We focus on the fraction of the institution's portfolio represented by the firm. In the context of acquisitions, we hypothesize that institutional monitoring will be greatest when the target firm represents a significant allocation of funds in the institution's portfolio. We show that this measure is important in reconciling mixed findings for total institutional ownership in the prior literature. The results indicate that our measure of institutional holdings leads to greater bid completion rates, higher premiums and lower acquirer returns. This empirical evidence provides support for theories predicting a beneficial effect of blockholders in monitoring the firm in general and in enhancing the gains to takeover targets in particular.

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1. Introduction

The importance of large shareholders has been long recognized in the finance literature. Shleifer and Vishny (1986) propose large shareholders as a solution to the free-rider problem of Grossman and Hart (1980). Yet, despite Shleifer and Vishny's explicit prediction that large shareholders can facilitate acquisitions even if they do not initiate them, unambiguous empirical evidence of such a role is absent from the literature, even when focusing on institutional blockholdings.[1] Most studies now treat institutional ownership in a realized or potential target as a control variable which is routinely associated with target premiums that are either positive (Edmans, Goldstein and Jiang, 2012, and Gaspar, Massa and Matos, 2005), insignificant (Bargeron, Schlingemann, Stulz and Zutter, 2008 and Ayers, Lefanowicz and Robinson, 2003), or negative (Huang, 2011, and Stulz, Walkling and Song, 1990).[2]

However, when institutions have multiple holdings across firms, they accrue differing benefits to monitoring effort across firms as well. Just like independent directors value their directorships differently and exert more effort on the ones they perceive to be more prestigious (Masulis and Mobbs, 2014), institutions could have incentives to monitor portfolio positions more than others. While an institution may hold a block in a given firm, that firm may represent a small part of the institution's total portfolio. A shareholder, institutional or otherwise, will focus its efforts on its largest holdings. When institutions have differing portfolio weights on an

[1] Recent studies examine the role of specific institutions in special situations. For example, Officer, Ozbas and Sensoy (2010) document that institutional ownership and premiums are positively correlated in the particular context of club deals (situations in which two or more private equity firms jointly sponsor a leveraged buyout). Likewise, Greenwood and Schor (2009) study a subset of institutions (hedge funds) that endogenously invest in firms to force them into a takeover. They find that such investments exhibit good performance if the firms are eventually acquired.

[2] The mixed results in the literature related to the effect of institutional ownership on takeover premiums obtain under different empirical specifications and alternative ways to proxy for institutional ownership and premiums.

individual firm, total institutional ownership is a noisy measure of the underlying variable of interest: the fraction of the equity held by institutions for which this is a significant holding.

In this paper, we argue that institutions allocate their monitoring effort to a firm based on the relative importance of the firm's stock in their portfolio. We define monitoring institutions as those whose holding value in the firm is in the top 10% of their portfolio. Using three measures based on the size of holdings by monitoring institutions in a given firm, we examine the role of institutional investors in the acquisition process. The acquisition process is an ideal laboratory to study the impact of such institutions because of their theoretically predicted role and the substantial external effects that their monitoring can generate in that setting.

Our results indicate that traditional institutional ownership proxies (measured relative to the target firm's outstanding shares) such as the number of (or the ownership by) blockholders are not related to the probability of deal completion, to the likelihood of bid revision, or to the premium offered for the target firm.

In contrast, we find that the probability of deal completion is increasing in the holdings of monitoring institutions in the target firm. A one standard deviation increase in the ownership of monitoring institutions results in a 6% higher probability of completion. Nonetheless, the presence of these interested monitoring institutions results in higher final premiums and lower acquirer returns as well. Specifically, a standard deviation increase in their holdings leads to a 4% higher probability of a bid revision and a 2.9% higher final premium (which translates into an additional $43 million for the average deal value of $1.49 billion). The end result is an acquirer announcement return that is lower by 0.6%. This lower return is economically important. It translates to a value reduction of over $79 million for the average acquirer in our sample. We also investigate monitoring institutions in the acquirer, noting that most of the

improvements from shareholder action that we hypothesize are sensible in the context of the target rather than the bidder. Indeed, controlling for monitoring institutions of the bidder does not affect our main results and does not incrementally explain bidder returns.

Thus, as the theory predicts, these investors facilitate completion of the deal, but at terms that are more favorable than average for the target. In a way, their presence as a monitoring institution with some negotiating power produces effects similar to those found in Hartzell, Ofek and Yermack (2004). The difference is that, unlike target CEOs, they cannot be bought-off with private benefits, so the benefits they negotiate for completion certainty accrue to all target shareholders.

Given that the terms are less favorable for the bidder, we test whether the presence of more monitoring institutions decreases the frequency of receiving a bid and find that it does. Relative to the 4% unconditional probability of receiving a bid, a standard deviation increase in monitoring institution ownership decreases the probability by 0.6%. Nonetheless, the net effect of lower bid frequency against higher premium and completion rate conditional on a bid is approximately zero in terms of the overall wealth impact on firm shareholders (as shown by unconditional premium regressions following Comment and Schwert (1995)). This evidence is consistent with the expected effect of monitoring institutions being incorporated into the price of the firms they monitor.

A clear concern is the endogeneity of the shares owned by monitoring institutions. We use exogenous changes in institutional holdings generated by Russell index reconstitutions to establish causality. Also, all of our tests control for the traditional measures of institutional ownership. Further, we extend the results and demonstrate their robustness with an extensive battery of additional tests. In addition to confirming robustness, these additional results are

consistent with our hypotheses about monitoring institutions and would be hard to reconcile with alternative explanations. We conclude that, as theory predicts, institutional investors are important to the outcome of an acquisition bid. However, due to limited resources and attention, these effects are only present when the stockholdings themselves are an important part of the institution's portfolio.[3] Thus our contribution comes both from suggesting a better measure of the relevant stakes for activist monitoring in a firm, and from demonstrating the net impact of such monitors on the acquisition process.

Our paper is related to work by Brickley, Lease and Smith (1988), Bushee (1998), Chen, Harford and Li (2007), and Cronqvist and Fahlenbrach (2009). All of those authors focus on heterogeneity in institutional investors to identify which institutions are more likely to play an active monitoring role. Our work also contributes to the vast literature on mergers and acquisitions, particularly papers that study the role of institutional investors in the process (e.g. Huang, 2011) and those that examine the relative bargaining power of the parties (e.g. Ahern, 2012).

Our study proceeds as follows. We develop our hypothesis in section 2. In section 3 we describe our sample and the variables we use to examine institutional ownership. Section 4 presents our empirical analyses and section 5 discusses additional tests we carry out in order to consider specific institutional characteristics. Section 6 explains the analyses we perform to assess the robustness of our results. Section 7 contains our conclusions. The Appendix provides the definition of all the variables we use in this study.

[3] Concurrent work provides evidence that reaffirms this conclusion. Qayyum, Nagel and Roskelley (2014) find that total payout to shareholders increases with the firm's portfolio importance to institutional investors. Pedersen (2014) finds that firms in which a blockholder has invested a large amount of capital lower the compensation of overpaid CEOs, reduce pay-for-luck for overpaid CEOs, strengthen the relation between CEO turnover and firm performance, and decrease their propensity to make value destroying acquisitions.

2. Hypothesis development

Monitoring costs include the costs of gathering information, analyzing it, and acting on it, including the costs of influencing others (be they the firm managers or other shareholders). Institutions can find it beneficial to become specialized monitors. That is, the internalizable monitoring benefit to their larger and potentially longer-term investments can outweigh the costs of gathering information and acting on it. However, unless they hold their portfolio firms in equal proportion, they will not exert equal monitoring effort across their holdings. Just as the fact that they hold more shares than the atomistic investor makes it beneficial for them to monitor at all, the fact that they invest more of their funds in some firms makes it relatively more beneficial for them to monitor those firms. Moreover, due to limited attention (or limited resources), it makes sense for investors to allocate more effort to the largest positions in their portfolios. As a result, their monitoring activities will be higher for firms in which they have invested a larger fraction of their portfolio.

Thus, we have our primary hypothesis, which is that monitoring activities in a given firm will be increasing in the importance of that firm to the institutions that hold it.

For a given firm, we will use the term, "monitoring institutions," to refer to those institutions investing a significant fraction of their portfolio in that firm. We test our primary hypothesis in the context of acquisitions. We predict that monitoring institutions will facilitate completion of an acquisition bid. They can do this either by voting or tendering their shares for the merger or by pressuring target managers to accept the bid.

The effect of monitoring institutions on the premium is ambiguous. They may facilitate more deals, including some lower premium deals that may have been otherwise successfully

resisted by entrenched target managers. Conversely, their size and active interest may mitigate the coordination problem among target shareholders, allowing institutions to bargain for a higher premium. Nonetheless, in a model that controls for the other determinants of the premium, the incremental effect of the monitoring institutions should be to increase the final premium. Thus, we predict that, ceteris paribus, monitoring institutions increase the premium.

The bargaining of the monitoring institutions is predicted to increase the premium to target shareholders, but should not increase the net synergies to the deal, which are determined by the operational fit of the acquirer and target. If monitoring institutions successfully bargain for more of the gains from the merger for target shareholders, then the net effect on acquirer shareholders will be negative. Thus, we predict that the incremental effect of the presence of monitoring institutions on acquirer announcement returns is negative.

Taken alone, the prediction that monitoring institutions will facilitate bid completion would also imply that there should be more bids for firms with monitoring institutions. However, the prediction that these institutions will also influence the bargaining over the value of the synergies has the opposite implication for attracting bids in the first place. Thus, the presence of monitoring institutions has an ambiguous effect on the probability of being targeted. To explore these issues in greater detail, we conduct a number of multivariate analyses with data which is described in the next section.

3. Sample formation and institutional ownership variables

This section details the sample of mergers and acquisition (M&A) bids we analyze as well as the proxies we use to track the ownership by institutional investors in the target firms we study.

3.1. Sample overview

We start with 7,292 M&A offers with a transaction value of at least $1 million tracked by the Securities Data Company (SDC) announced during 1984-2011 in which both the target and the acquirer are publicly traded U.S. companies. Our sample begins in 1984 because, as Chen, Harford and Li (2007) note, the M&A information in SDC is incomplete before 1984. Following Moeller, Schlingemann and Stulz (2004) and Masulis, Wang and Xie (2007), this initial sample excludes spinoffs, recapitalizations, exchange offers, repurchases, self-tenders, privatizations, acquisitions of remaining interest, partial interests or assets, and transactions whose value relative to the bidder's market capitalization at the fiscal year end prior to the merger announcement is less than 1%. We keep 3,377 deals in which targets and acquirers have stock market and accounting data available from the Center for Research in Security Prices (CRSP) and from Compustat, respectively. We exclude transactions without coverage for the target company from the Thomson-Reuters Institutional Holdings 13F database (formerly known as CDA/Spectrum). This database contains ownership information by institutional managers with greater than $100 million of equity securities under discretionary management; common stock positions greater than 10,000 shares or those valued at $200,000 or more. These criteria yield our final sample of 1,601 deals.

Panel A of Table 1 provides the temporal and industrial distribution of our sample. We note that the annual number of bids declines at the beginning of our sample and also during 2008-2009 which coincide with periods of economic contraction. Conversely, the number of transactions is higher during the 1998 to 2001 period of economic expansion when the stock market valuation is higher. The temporal distribution of our sample is in line with the merger activity reported in numerous prior studies. The industrial distribution of our sample targets is

based on the Fama and French (1997) classification. Targets are well scattered across industries with two exceptions. The Business Services (which includes software) and the Banking sectors exhibit some clustering with just over 12% and 21% of the target firms belonging to those industries, respectively. Moreover, targets in the Banking, Insurance, Real Estate and Trading (which, broadly defined, correspond to the Financial industry) account for over 27% of the observations. While most studies typically exclude the Financial industry, there were two merger waves in that industry during our sample period, accounting for its high representation. Nonetheless, because of the high concentration of targets in the Financial sector, in robustness tests we verify that our results are not driven by firms that belong to this industry.

Panel B of Table 1 reports deal and target characteristics of our sample. Our summary statistics are similar in most important respects to the samples used elsewhere in the M&A literature. Among the 1,601 bids we analyze, about 18% are tender offers. This incidence compares favorably to that in Huang (2011). His sample of acquisitions during 1980-2008 consists of 18% tender offers. Just over 91% of transactions in our sample consist of friendly mergers. This frequency also resembles that in Officer's (2003) study of mergers during 1988-2000. The deals we study have a completion rate of just over 83%, which is similar to that of 84.6% in Gaspar, Massa, and Matos's (2005) M&A study of transactions during 1980-1999. Over 33% of the offers in our sample are paid in cash. This incidence is comparable to that of 35% in Officer (2003). In 33.4% of our transactions, both the target and the bidder operate in different industries and exhibit a mean relative size of about 34.8%. These statistics are comparable to those in Duchin and Schmidt (2013). For their 1980-2009 M&A sample, they report an incidence of 36.5% of transactions in which the parties to the deal operate in different industries and a mean relative size of 37.9%. Our sample targets exhibit an average Tobin's Q of

1.83. For a similar ratio, Bargeron, Schlingemann, Stulz, and Zutter (2008) report a mean value of 1.55 for the targets they study. The mean leverage for our target firms is slightly above 21% which is comparable to that of 20% in Cai and Sevilir (2012).

3.2. Measures of institutional ownership

Panel A in Table 2 reports summary statistics for different measures of institutional ownership. The first five rows in the table provide institutional ownership measured *relative to the target firms' shares outstanding* which are the metrics most often used in the literature. Targets in our sample have an average of 1.5 blockholders and these blockholders account for about 5.5% of all institutions holding the target's shares. Blockholders are defined as institutions owning at least 5% of the target's shares. The mean (median) target equity ownership by blockholders in our sample is 12.66% (9.16%). On average, the largest shareholding by an institution is just over 8%. For a similar measure, Chen, Harford and Li (2007) report an average of 7.1%. We find that the top five institutions (in terms of ownership) control approximately 21% of the target's shares. Comparably, Hartzell and Starks (2003) report that the top five institutions in their sample control about 22% of the firm's stock.

Panel A also presents our proposed measures of institutional ownership. These measures capture the *relative importance of the target firm to the institutional investor*. As argued earlier, we hypothesize that monitoring activities in a given target firm will be increasing in the importance of that firm to the institutions that hold it. Based on this conjecture, we define *monitoring institutions* as those whose holding value in the target firm is in the top 10% of their portfolio, although all of our results continue to hold when we change the holding value threshold in the target to be in the top 5% of the institution's portfolio. On average, targets in our sample are held by 4 institutions classified as monitoring institutions and they account for only 2.4% of all

institutions holding the target shares. The mean total target equity ownership by monitoring institutions is 6.83%. The last three rows of panel A summarize the number, proportion and ownership of monitoring institutions in a firm, conditional on there being at least one monitoring institution present. There are 696 targets for which this is the case. When monitoring institutions are present, the median number of monitors in the same firm is 3 and they represent about 5% of the institutions holding the firm. They control about 11% of the target at the median and 16% at the mean.

Panel A shows important differences between the traditional blockholder metrics and our monitoring institutions measures. For instance, the distribution of the number of monitoring institutions is remarkably different from that for the number of blockholders. The latter variable exhibits a lower mean, a higher median, and a much lower standard deviation. Likewise, total ownership by institutional investors exceeds the total ownership by monitoring institutions in terms of both the mean and the median. These distributional differences are also evident when we look at the annual decomposition of the traditional blockholder and our proposed monitoring institutions variables in Panel B of Table 2. An alternative way to measure the importance of a position in an institution's portfolio would be to use the dollar value of such position. To estimate this dollar value one would multiply the percentage of the firm's equity the institution owns by the firm's market value. To capture this, in some of our multivariate tests, we use the percentage of equity in the target owned by the institutional investor as the key independent variable while controlling for the target's size.

To offer a perspective from the institutional investors' side, the last two rows of Panel A of Table 2 present statistic related to the 4,155 institutions that hold equity in our target firms. At the median, almost 11 positions (which may not necessarily include a sample target) are

considered monitored according to our definition. These positions represent just over 40 percent of the institution's portfolio value.

4. Institutional monitoring during acquisitions

In order to study the effect of monitoring institutions we perform a number of multivariate tests. The definitions for all of the variables used in these analyses are provided in the Appendix.

4.1. Deal completion

We first examine the relation between institutional ownership and deal completion. In Table 3, we report the estimation of four variants of a logit model in which the dependent variable equals one for completed deals and zero for withdrawn deals. Officer (2003) estimates a similar model. Therefore, except for the controls for institutional ownership, all independent variables in our regressions are similar to his. To account for the role of institutional investors, all the tests in Table 3 control for total institutional blockholder ownership in the target firm. In addition, in models (2), (3), and (4) we respectively add the number of monitoring institutions, the proportion of monitoring institutions, and the total ownership of monitoring institutions as control variables.

We note that the blockholder variable –an often-used proxy to control for institutional ownership in the literature– does not attain statistical significance in any of the tests reported in Table 3. In contrast, all of our proxies for monitoring institutions exhibit positive and statistically significant coefficients which imply a non-trivial effect on the likelihood that the deal materializes. For example, according to the marginal effect in model (4), a one standard

deviation increase in ownership by monitoring institutions is associated with a 6 percentage point increase in the probability of deal completion.

Results for the other independent variables in Table 3 are consistent with those in the existing M&A literature. For example, transactions in our sample are about 19 percentage points more likely to complete if there is a target termination fee. This marginal effect is close to that of 17 percentage points that Officer (2003) estimates for the same variable. Tender offers are 8 percentage points more likely to go through, as are mergers in which the parties to the transaction are in the same industry. Comment and Schwert (1995) and Schwert (2000) argue that deal attitude is crucial for mergers to be completed. This is certainly true in our sample: Deals characterized as hostile are 39 percentage points less likely to be completed. Relatedly, Huang and Walkling (1987) find that the higher the merger announcement return obtained by acquisition targets the less likely these firms are to resist their takeover. Consistent with this, we find that deals in which targets get a higher merger announcement cumulative abnormal return (CAR) are more likely to be completed.[4]

4.2. Bid revisions

An analysis of the bid revisions for the transactions in our sample provides a test of the potential monitoring by institutional investors and the effect of such oversight on the wealth of shareholders. We define a bid revision as the percent difference between the initial and final bid premium offered for the target firm as recorded by SDC. We note that 161 (or 10.05%) of the bids in our sample suffer a revision. This incidence is similar to that of 10.32% in Bates, Lemmon and Linck (2006).

[4] In untabulated analyses, we re-estimate Table 3 by expanding the controls to include governance variables (e.g.: G-index (Gompers, Ishii, and Metrick, 2003), board size, board ownership, board independence, busy boards, and Delaware incorporation). These tests, which are performed in a subsample of firms for which these variables are available from the RiskMetrics database, produce results that are qualitatively similar to those tabulated.

In Table 4, we estimate five bid revision logit regressions similar to those in Bates, Lemmon and Linck (2006). The dependent variable is set to one in model (1) if there is any bid revision, in model (2) if the bid is revised downward, and in models (3)-(5) if the bid is revised upward. The variables used to control for institutional ownership are similar to those we use in the deal completion analyses.

Our bid revision tests indicate that the total ownership by blockholders is not related to any of our dependent variables. Conversely, all of our proxies for institutional monitoring are associated with increases in the bid premium offered to the target firms. According to the marginal effect we estimate in model (3), a one standard deviation increase in ownership by monitoring institutions increases the probability of an upward bid premium revision by 5.2 percentage points. We note that the same monitoring institution variable is unrelated to the probability that the initial bid is revised downward.[5] The results in Table 4 might be consistent with our hypothesis that institutions are more likely to monitor a firm when it becomes a takeover target –particularly when the company is an important holding in the institution's portfolio.

4.3. Acquisition premiums

If a takeover target represents a key holding in an institution's portfolio which leads this investor to intensify its monitoring, then we may observe such effect in the premium offered to the target. Therefore, we examine the role of both the traditional and our proposed measure of institutional ownership on the acquisition premiums. Before performing this analysis, we note that firms are unlikely to receive an acquisition bid by chance. Consequently, in Panel A of Table

[5] In unreported tests we find that none of our other proxies for monitoring institutions (described in Table 2) are related to downward bid revisions. Likewise, none of the traditional blockholding or institutional ownership measures is related to any type of bid premium revision.

5, we estimate four logit regressions of the probability of becoming an acquisition target using 154,227 firm-year observations during 1983-2011. In all tests, the dependent variable is set to one if the firm becomes a takeover target and is set to zero otherwise. Our specification augments those in Palepu (1986) due to the inclusion of our controls for institutional ownership.

The results in Panel A indicate that total institutional blockholder ownership has no significant effect on the probability of becoming a target. In contrast, all of our monitoring institutions' proxies attain negative and significant coefficients. The marginal effect we estimate in model (4) of Panel A indicates that a single standard deviation increase in ownership by monitoring institutions lowers the likelihood of becoming a target by 0.6%. To put this result in perspective, the unconditional probability of becoming a target in the sample analyzed in Panel A of Table 5 is 4.41%. One potential interpretation of this result is that a firm that is operating efficiently (due to the oversight of monitoring institutions) is less likely to be disciplined by the takeover market. However, without an analysis of the merger premiums offered to firms with monitoring institutions (which we conduct next) the foregoing conjecture cannot be fully substantiated.

Following the two-step procedure suggested in Heckman (1979) we address issues related to self-selection because firms do not randomly become acquisition targets. Therefore, we estimate an inverse Mill's ratio from each of the four models in Panel A in Table 5 and respectively use them as additional controls in the four premium regressions we report in Panel B of Table 5. These regressions include year- and industry-fixed effects and use the four-week premium reported by SDC as the dependent variable, where we follow Officer (2003) and limit the premium to values between 0 and 2 (or 200%). Our target premium tests closely follow the specification in Bargeron, Schlingemann, Stulz, and Zutter (2008). In model (1), the main

independent variable is the total ownership held by blockholders in the target firm. In model (2), (3), and (4) the independent variables of interest are the number of monitoring institutions, the proportion of monitoring institutions, and the total ownership of monitoring institutions, respectively.

The coefficient for the blockholder variable is not statistically significant in any of the premium regressions reported in Panel B of Table 5. However, the same tests document an economically important positive association between all of our monitoring institutions proxies and the takeover premiums. According to the estimates in model (4), increasing the ownership of monitoring institutions by one standard deviation translates into a premium increase of 2.9 percentage points. For the average transaction in our sample, this increase represents an additional $43 million in terms of deal value for the target shareholders. These results support our view that institutions do monitor targets when targets account for an important holding in the institutions' portfolios.[6]

We note that the estimates for several control variables in Panel B of Table 5 are in agreement with the existing M&A literature. For example, acquisition premiums are inversely related to the size of the target firm (Bargeron, Schlingemann, Stulz, and Zutter, 2008), to the relative size of the parties (Cai and Sevilir, 2012), and also decline when the transaction is characterized as a merger of equals (Wulf, 2004, and Wang and Xie, 2009). In contrast, premiums increase when the transaction includes a target termination fee (Officer, 2003), when there are competing bids (Gaspar, Massa and Matos, 2005), when cash is used as the sole medium to pay for the consideration (Aktas, de Bodt and Roll, 2010) and when the deals are

[6] We also examine smaller portfolio holdings by defining a "low monitoring" position if the target firm is in the bottom 10% of the institution's portfolio. In a premium regression similar to model (4) of Panel B in Table 5, the estimate for the total ownership of low monitoring institutions is not statistically significant (*p*-value = 0.4347).

characterized as tender offers (Bates, Lemmon and Linck, 2006). As in Massa and Xu (2013), more liquid targets also get higher premiums. The fact that the effect of monitoring institutions on premiums is robust the inclusion of the target's liquidity (measured following Amihud, 2002) is important given the academic debate on whether liquidity strengthens or weakens institutional monitoring (see Kahn and Winton (1998), Maug (1998), Faure-Grimaud and Gromb (2004), and Back, Li, and Ljungqvist (2014) among others).

4.3.1. Activist investors

Recent research finds that investors perceive activism (particularly by hedge funds) to be value-increasing. For example, Brav, Jiang, Partnoy, and Thomas (2008) show that the announcement of hedge fund activism is met by abnormal returns of more than 7%. Moreover, Klein and Zur (2009) document that firms exhibit even larger abnormal returns (of 10.2%) upon the filing of an SEC Schedule 13D in which the hedge fund activist investor vows to confront the firm's management.[7] Greenwood and Schor (2009) conclude that hedge funds' success in forcing a firm (in which they have invested) into a takeover accounts for the high returns to activism documented in the literature. This conclusion is based on their empirical results showing that firms subject to activism (i) earn high returns primarily if they are eventually taken over and (ii) earn average abnormal returns that are not statistically distinguishable from zero if they are not acquired.

Using a classification method similar to that in Greenwood and Schor (2009), we find that among the 4,155 different institutional investors that hold shares in our sample targets, 165

[7] Schedule 13D is a filing that must be submitted to the SEC within 10 days by anyone who acquires beneficial ownership of more than 5% of any class of publicly traded securities in a public company. Sections 4 and 5 of Schedule 13D are respectively labeled "Purpose of Transaction" and "Interest in Securities of the Issuer." These are intended to shed light on the objectives of the party buying the shares.

are coded as activists.[8] In our sample of 1,601 deals, 1,189 targets are held by at least one activist investor. To evaluate the potential effects of activism in our setting, we define an Activists (0,1) variable which is set to "1" when at least one monitoring institution holding the target's shares is identified as an activist and set to "0" otherwise. In an untabulated test, we use this variable to estimate the following variant of model 4 in Panel B of Table 5:

Merger premium = Total ownership of monitoring institutions + Activists (0,1) + *Total ownership of monitoring institutions* × *Activists (0,1)* + Other controls (1)

The coefficient for the standalone monitoring institution variable is 0.2306 (*p*-value = 0.0350) while for the interaction term it is 0.3783 (*p*-value = 0.0574). The joint effect of these variables is also statistically significant. These estimates imply that raising the total ownership of monitoring institutions by a single standard deviation when at least one institution is an activist is associated with a 4.62% increase in the merger premium. This result indicates that the effect of monitoring institutions is magnified when at least one institution is classified as an activist investor.

4.4. Unconditional premiums

In their study of poison pills, Comment and Schwert (1995, p.30) argue that "The estimated effect of antitakeover measures on the unconditional premium is of interest because it is a net effect of a decrease in the premium if antitakeover devices deter offers and an increase if they increase premiums in successful takeovers." Unlike poison pills, institutional ownership is not an antitakeover device. Nevertheless, the tests in Panel A of Table 5 suggest that monitoring institutions deter takeover offers as we find an inverse association between these institutions and the probability that a firm becomes a takeover target. At the same time, in Panel B of Table 5 we

[8] Prominent activists in our sample include, among others, Breeden Capital Management, D.E. Shaw & Co., Discovery Group, Greenlight Capital, Icahn Associates, and Riley Investment Management.

find that monitoring institutions are associated with higher takeover premiums. To examine the net effect of these institutions in the gains to target shareholders we use the method in Comment and Schwert (1995) to estimate *unconditional* premium regressions. We run these tests, which are reported in Table 6, in a sample of 154,227 firm-years with data available from CRSP and Compustat during 1983-2011. As in Comment and Schwert, we set the premium to zero in nontakeover firm-years. Our unconditional premium regressions control for institutional ownership in a manner similar to that in previous multivariate tests.

The estimates in Table 6 show that the unconditional premium is not a statistically significant function of either the blockholder variable or our monitoring institutions proxies. Therefore, together with our earlier results, the tests in Table 6 suggest that the net effect of lower bid frequency against higher premium and completion rate conditional on a bid is approximately zero in terms of the overall wealth impact on target shareholders. This evidence suggests that monitoring institutions are relevant—their effect is already incorporated into the price of the firms they monitor. Further, since the positive impact of the monitoring institutions is priced, the increase in premium we find conditional on a bid underestimates their full impact on firm value. Thus, the 2.9% higher premium for a one standard deviation increase in monitoring institutions' holdings can be viewed as a conservative estimate of their value impact.

4.5. Endogeneity

Recent work by Giannetti and Simonov (2006) shows that institutions appear reluctant to invest in companies with weak corporate governance. Their findings suggest that even if institutions are able and motivated (due to higher stockholdings) to monitor a firm, they prefer to invest in companies in which monitoring may not be necessary. Using a similar logic and in our setting, it is possible that institutions raise their shareholdings in firms that are likely to be

acquired or are particularly likely to earn higher premiums if they become acquisition targets. Under any of these possibilities, causality runs in the opposite direction and our assertion that the higher deal completion probabilities and takeover premiums we observe obtain due to the influence of monitoring institutions would be incorrect.

To address the endogeneity problem just described, we employ a fuzzy regression discontinuity design approach in the context of an instrumental variable (IV) estimation similar to that in Schmidt (2012) and in Crane, Michenaud and Weston (2012).[9] Following their empirical scheme, our identification strategy exploits the nature of the Russell index composition and annual reconstitution. Every year in June, the largest 1,000 firms (in terms of market capitalization) are selected to make up the Russell 1000 index and the next 2,000 firms are included in the Russell 2000 index. Since both indices are value-weighted, institutions tracking them will have to adjust their holdings in particular firms when these companies switch from one index to the other, enter one of the indices for the first time, or leave an index. These adjustments are likely to create a non-trivial exogenous discontinuity in a firm's ownership structure. Indeed, Chang and Hong (2012) find that firms that are first included in the Russell 2000 index experience higher returns after the index is reconstituted. Those authors argue that this phenomenon is due to price pressure that results from higher institutional demand for the new Russell 2000 stocks.

In fact, all firms (affected or not) might change in terms of their weight and relative importance to the institutions that hold them. Consequently, our instrument satisfies the relevancy condition because index changes are correlated with changes in monitoring institutions. Since inclusion in the Russell indices is based on market capitalization, variations in

[9] See, Lee and Lemieux (2010) for technical details on the regression discontinuity design (RDD) approach in general and Roberts and Whited (2012) for a primer on the fuzzy RDD in particular.

index membership are not random, but correlated with changes in market capitalization. Nonetheless, a firm's index membership becomes random when controlling for differences in market capitalization. In this setting, our change in the number monitoring institutions instrument satisfies the exclusion restriction because it is conditionally random: it consists of the change in index membership conditional on changes in market capitalization. As in Schmidt (2012), controls for the change in market capitalization include a continuous measure tracking how many rankings the raw market capitalization changed (change in ranking in Russell(t-1 , t)) and its squared term, respectively.

Consequently, to evaluate the causal relationship between monitoring institutions and bid premiums we use an IV approach based on the changes in holdings by these institutions upon index reconstitutions. These changes in holdings are likely to change the number, proportion, and total ownership of the monitoring institutions in our sample.

To implement the IV estimator, we first regress changes in the number of monitoring institutions on a set of instruments and control variables. As in Schmidt (2012), the instruments consist of discrete changes (dummy variables to indicate index switches, index departures, and index entrances) and continuous changes tracked by differences in the annual Russell Rankings. We employ the methods outlined by Staiger and Stock (1997) to test the validity of these instruments.

For the first stage test, we use 154,227 firm-year observations with data available from both CRSP and Compustat during 1983-2011. During this period, we track 31,407 changes related to a Russell 1000/2000 reconstitution as follows: 4,041 firms (or 2.6%) switch from the 1000 to the 2000 index, 19,348 are removed from the 2000 index, 2,237 switch from the 2000 to the 1000 index, and 5,781 are newly added to the 2000 index. For our purposes, the annual

Russell 1000/2000 index reconstitutions *directly* affect 216 of our 1,601 sample targets as follows: 32 switch from the 1000 to the 2000 index, 99 are removed from the 2000 index, 24 switch from the 2000 to the 1000 index, and 61 are new additions to the 2000 index. It is important to note that some targets firms that are not directly affected by these changes could be *indirectly* impacted by index reconstitutions involving other (index) firms that are held in the portfolio of the same institutional investors. In other words, the weight of a target firm in the institution's portfolio could change due to changes in weights of non-target portfolio firms directly affected by an index reconstitution.

The first stage regression of the change in the number monitoring institutions is reported as model (1) in Table 7. We calculate changes in the number of monitoring institutions from the end of the third quarter in year *t-1* to the end of the third quarter in year *t* because index reconstitutions occur annually at the end of May/beginning of June.[10] According to the estimates, if a firm switches from the Russell 1000 last year to the Russell 2000 in the current year, the company exhibits a decline of about one monitoring institution. This finding is broadly consistent with Schmidt (2012), who uses switches to the Russell 2000 to identify exogenous increases in passive investors.

In the second-stage test, the fitted value for the change in the number of monitoring institutions becomes the key explanatory variable in the premium regression reported in model (2) of Table 7.[11] The coefficient for the instrumented variable of the change in the number of monitoring institutions is positive and statistically significant. This finding indicates that firms that become a top holding in an institution's portfolio (due to Russell index reconstitutions)

[10] According to this time line, deals in our sample announced in the fourth quarter occur in year *t* whereas those announced anytime during the first three quarters occur in year *t+1*.

[11] The standard errors in this regression are adjusted for the fact that the instrumental variable for monitoring institutions is estimated. See Roberts and Whited (2012) for a discussion of this issue.

receive higher takeover premiums. This result suggests that these monitoring investors are responsible for the higher premium and, therefore, mitigates the concern that causality runs in the opposite direction. The results in Table 7, which exploit the exogenous nature of the Russell index reconstitutions, also alleviate the concern that some institutions in our sample somehow have the ability to predict or anticipate takeovers which, in turn, leads these investors to overweight certain firms in their portfolios. Moreover, the index reconstitutions results also cast doubt on the idea that our results are mostly driven by institutions that purposely overweight certain positions (relative to a benchmark). Indeed, our IV analyses suggest that an exogenous shock to an institution's portfolio weights (and not a pre-determined investment strategy) appears to induce the institutions to monitor portfolio positions that experience an increase in weight.[12]

We employ a similar empirical procedure to instrument for the proportion of monitoring institutions as well as for the total ownership of monitoring institutions. The second stage results for these proxies, which are respectively reported as models (4) and (6) in Table 7, also suggest that monitoring institutions cause target firms to earn higher premiums. Overall, the results in Table 7 support the hypothesis that institutional monitoring will be greatest when the target firm represents a significant allocation of funds in the institution's portfolio.

4.6. Acquirer returns, division of gains, and synergies

To test whether monitoring institutions of the target firm affect the returns to acquirers, in Panel A of Table 8, we run four ordinary least squares (OLS) regressions of the three-day merger CAR meeting the bidders in our sample. This CAR is centered on the acquisition announcement

[12] Nevertheless, the IV tests do not rule out the possibility that some targets are held by certain "types" of institutions and that we are just picking up targets with large weights in the portfolios of those institutions. Ideally, this issue could be addressed econometrically by including institutions' fixed effects in our analyses. We note, however, that this is not feasible since we have over 4,000 institutions holding shares in 1,601 targets. Nonetheless, in section 5 we study the effect of institutions based on their propensity to monitor (passive vs. active types) as in Bushee (1998) and also based on their independence from the firm's management (pressure sensitive vs. pressure resistant types) as in Brickley *et al.* (1985).

day. We follow the M&A literature in order to properly specify our acquirer return regressions. Therefore, all models in Panel A control for variables similar to those in the acquirer return tests performed by Moeller, Schlingemann, and Stulz (2004) and by Masulis, Wang, and Xie (2007). In our acquirer return tests, we expand the specification in those studies by including our proxies for institutional ownership.

The estimates in Panel A of Table 8 indicate that acquirer returns decrease in our target monitoring institutions proxies. Using the estimate in model (4), a one standard deviation increase in the ownership of monitoring institutions is associated with a 0.62% decrease in the return to the acquirer. This drop implies a value decline of over $79 million for the average bidder in our sample with a market capitalization of $12.7 billion.[13]

Together with the results from our bid premium regressions, our acquirer return tests indicate that monitoring institutions increase the bargaining power or effort of the target managers, resulting in them negotiating a bigger "piece of the pie" for their shareholders. To evaluate how the pie is divided we follow the procedure in Ahern (2012). Specifically, in Panel B of Table 8 we estimate a set of regressions in which the dependent variable is the target's gain relative to the acquirer's gain. To construct this variable we first estimate the target $CAR and the acquirer $CAR as the cumulative abnormal return earned over three days surrounding the merger announcement adjusted by the equally weighted Center for Research in Security Prices index and then multiplied by market equity of the firm two days before the merger announcement. Next, we compute the target's $CAR minus the acquirer's $CAR. We then divide this difference by the sum of acquirer and target market values 50 trading days before the merger

[13] Some of the control variables in Table 8 produce results that conform to the existing literature. For example, as in Malmendier, Opp, and Saidi (2012), acquirer returns are higher when cash is used to buy the target firm. Like Moeller *et al.* (2004), we find that acquirer returns are lower in M&A intensive industries (i.e., those with a high liquidity index). As in Roosenboom, Schlingemann, and Vasconcelos (2013), we also find an inverse relation between the acquirers' liquidity and the announcement returns meeting these firms.

announcement to obtain our relative gain dependent variable. All of the control variables in Panel B of Table 8 are similar to those in Panel A. However, to conserve space, we only report the variables tracking institutional ownership.

Model (1) of Panel B indicates that ownership by blockholders is unrelated to the division of gains. In contrast, the other regressions in Panel B show that when monitoring institutions are present, targets get a relatively higher share of the gains. According to model (4) for example, a one standard deviation increase in the total ownership of monitoring institutions is associated with an increase of 1.09% in the relative gain of the target vs. the acquirer per dollar of total market value. Thus, the effect of monitoring institutions is economically important because in our sample the unconditional mean relative gain is 3.66%, which is close to that of 3.52% reported by Ahern (2012) who analyzes transactions during 1980-2008.

Next, we evaluate whether monitoring institutions affect the synergies in M&A deals. To do so, in untabulated tests, we estimate four OLS regressions of the total percentage synergistic gain from acquisitions. We calculate this measure as the three day CAR for a value-weighted portfolio of the acquirer and the target. As in Bradley, Desai, and Kim (1988), the CAR is centered on the merger announcement date. Our synergy regressions use control variables similar to those in the synergy tests reported by Wang and Xie (2009). To their specification we add our measures of institutional ownership in the target firm. The results show that neither the traditional blockholder proxies nor our monitoring institutions measures are statistically related to synergies. These findings support our prediction that monitoring institutions should not increase the net synergies to the deal.

Collectively, our results show that M&A deals in which there is oversight by monitoring institutions of the target firm exhibit a transfer of some of the synergy gain from acquirer

shareholders to target shareholders. The fact that the ownership structure of the target firm affects the gains to the acquirer is potentially important because it raises the possibility that cross-ownership by institutions can account for this result. We address this issue in one of the robustness tests provided in section 6.

5. Additional analyses

Studies by Brickley, Lease, and Smith (1988), Bushee (1998), Hartzell and Starks (2003), and Schmidt (2012) (among others) investigate whether institutional investors exert effort to influence management. Although the evidence on this issue is mixed, a reasonable conclusion from these papers is that some—but not all—institutional investors appear to influence management on some corporate activities (such as antitakeover amendments, R&D investment decisions, and CEO compensation). Based on this literature and because institutional investors tend to have a particular focus, we employ several existing methods to identify institutions more likely to undertake a monitoring role. Specifically, we use classifications for pressure sensitivity (Brickley, Lease and Smith's (1988)), horizon (Bushee's (1998) and (Gaspar, Massa and Matos' (2005)), active management (Cremers and Petajisto's (2009)), and blockholder status.

5.1. Pressure sensitivity

Brickley, Lease and Smith (1988) note that some institutions are not really independent of management because they are linked to a portfolio firm through other business activities. Because insurance companies, banks, and nonbank trusts are more likely to be subject to management's influence, those authors define them to be pressure sensitive institutions.

To assess the effect of potential pressure exerted by the target's management on an institution holding the target's shares, we expand the specification of the premium tests reported in Table 5 to estimate the following (untabulated) regression:

Merger premium = Total ownership of monitoring institutions + Independent institutions (0,1) +

Total ownership of monitoring institutions × *Independent institutions (0,1)* + Other controls (2)

In this test, the dummy variable is set to "1" when at least one monitoring institution holding the target's shares is classified as an independent institution (using the definition in Chen, Harford, and Li (2007) that adjusts the classification in Brickley *et al.* to fit the Spectrum dataset taxonomy). Thus, independent institutions include investment companies (from Spectrum type 3 institutions), investment advisors (from Spectrum type 4 institutions), and public pension funds, foundations, and endowments (from Spectrum type 5 institutions).

The estimate for the monitoring institution variable is 0.2070 (*p*-value = 0.0635). The coefficient on the interaction term in the above model is 0.5274 (*p*-value =0.0660). The combined effect of these variables is also statistically significant. According to these results, a one standard deviation increase in the total ownership of monitoring institutions in the presence of at least one independent institution is associated with a premium increase of 6.44%. This result suggests that the effect of monitoring institutions appears stronger when the investors are more likely to be independent from management.

5.2. Horizon

Bushee (1998) classifies institutions into three groups—dedicated, quasi-indexer, and transient—based on their past investment patterns in the areas of portfolio turnover, diversification, and momentum trading. While transient institutions are not expected to exert

effort to influence managers, dedicated institutions (and perhaps quasi-indexers) are more likely to perform the full monitoring role of gathering information and attempting to influence managers. To consider this possibility, we refine our tests by developing a measure that intersects our monitoring institutions proxies with those classified by Bushee's method as dedicated and quasi-indexer investors. We use this measure to identify transactions in which the target firm is held by monitoring institutions and also by institutions with investment styles suited to monitoring activities. With this information, we estimate a regression by expanding model 4 in Panel B of Table 5 as follows:

$$\text{Merger premium} = \text{Total ownership of monitoring institutions} + \text{Dedicated (0,1)} + \textit{Total ownership of monitoring institutions} \times \textit{Dedicated (0,1)} + \text{Control variables} \quad (3)$$

In this regression, the variable Dedicated (0,1) is set to "1" when at least one monitoring institution holding the target's shares is classified as dedicated or quasi-indexer and is set to "0" otherwise. The estimate for the Total ownership of monitoring institution is 0.2170 (*p*-value = 0.0592) and the coefficient on the interaction term is 0.4610 (*p*-value = 0.0438). In addition, the joint effect of these variables is statistically significant. According to these estimates, a one standard deviation increase in the total ownership of monitoring institutions when at least one is a dedicated investor is related to a 5.63% increase in the merger premium. Thus, the effect of monitoring institutions strengthens whenever they are also dedicated investors.

Since it is probably not appropriate to group quasi-indexers and dedicated investors in a single category, we also estimate Model (3) by only including the latter investors in the Dedicated (0,1) indicator variable. The parameter for the interaction variable is now 0.6062 (*p*-value = 0.0039) and the joint effect between the interaction and the standalone monitoring institution variable is still statistically significant. These estimates imply a 7.4% increase in the

merger premium for a single standard deviation increase in the total ownership of monitoring institutions when at least one of them is a dedicated investor. This suggests that some of the quasi-indexers are behaving passively since the effect from combining dedicated and quasi-indexer is lower.

Similarly, Gaspar *et al.* (2005) focus on portfolio turnover as the defining characteristic of the institution and argue for better monitoring in the presence of lower turnover. We classify an institution as low-turnover if its average portfolio churn rate (how frequently it rotates the positions on all the stocks in its portfolio) over the four most recent quarters (immediately preceding the merger announcement) is in the bottom third of the distribution of all institutions covered in the 13F database at the quarter end. We use this classification to define a dummy variable which we set to "1" if at least one monitoring institution is also a low-turnover (long investment horizon) institution and set to '0" otherwise. With this dummy variable we expand the specification presented in Table 5 (Model 4 of Panel B) and estimate the following regression:

Merger premium = Total ownership of monitoring institutions + Low-turnover (0,1) + *Total ownership of monitoring institutions* × *Low-turnover (0,1)* + Control variables (4)

The parameter estimate on the interaction term is 0.3977 (p-value = 0.0545) whereas the stand alone coefficient for the monitoring variable is 0.2162 (p-value = 0.0392). The combined effect of these variable is also statistically significant. Our estimates imply a 4.86% increase in the merger premium related to a one standard deviation increase in the total ownership of monitoring institutions when at least one is classified as low-turnover. This result suggests that, whenever their investment horizon is long, the impact of monitoring institutions intensifies.

5.3. Active share

Equity fund managers can outperform their fund's benchmark by taking positions that are different from those in the benchmark. Based on this premise, Cremers and Petajisto (2009) define Active Share as the portion of portfolio holdings that differs from the benchmark index holdings. Their results show that mutual funds with the highest Active Share significantly outperform their benchmarks. To evaluate to role of Active Share in our setting, we classify an institution to be active if its Active Share is in the top third of the distribution of all institutions tracked in the 13F database during the last quarter ending prior to the acquisition announcement (analogous to the classification used by Cremers and Petajisto (2009). We use this definition to define an indicator variable which is equal to "1" if at least one monitoring institution is also classified as active. The indicator is equal to "0" otherwise. With this variable we estimate the following OLS model:

Merger premium = Total ownership of monitoring institutions + Active (0,1) + *Total ownership of monitoring institutions* × *Active (0,1)* + Control variables (5)

The results of regression (5) suggest that the effect of monitoring institutions is stronger if they are also classified as active investors. The estimate on the interaction term is 0.3619 (*p*-value = 0.0399) and the stand alone monitoring institution coefficient is 0.2128 (*p*-value = 0.0392). Moreover, the joint effect of these variables is statistically significant as well. According to these coefficients, raising the total ownership of monitoring institutions by a single standard deviation when at least one institution is classified as active is associated with a 4.42% increase in the merger premium.

5.4. Monitoring institutions that are also blockholders

The rationale for our monitoring institution measure is that their motivation to exert influence on management increases with the size of their shareholdings in a given firm. The rationale for the 5%-blockholding measures traditionally used in the literature is that firms must pay attention to their largest shareholders. To study potential differences between institutions with incentives to monitor versus traditional blockholders, we test whether one of these characteristics dominates the other and also estimate their joint effect. The joint effect is of interest because it could provide evidence of coordination between investors with an incentive to monitor and those with the blocks to have the most influence. To capture this, we estimate the following variant of model 4 in Panel B of Table 5:

Merger premium = Total ownership of monitoring institutions + Number of blockholders +

Total ownership of monitoring institutions × *Number of blockholders* + Controls (6)

In the above specification, the coefficient on the interaction term is not statistically significant (*p*-value = 0.7433). Likewise, the coefficient for the blockholder variable is not statistically different from zero (*p*-value = 0.4863). However, as with our tabulated analyses, the standalone coefficient for the monitoring institutions variable is positive and statistically significant (0.2002, *p*-value = 0.0248). The joint effect of these variables is also significant. These results suggest that even if the monitoring institution is not a blockholder, its incentive to monitor is enough to have an effect.[14]

6. Robustness

[14] We also redefine blockholder to be equal to 1 only when one of the monitoring institutions is also a blockholder. The interaction term is still insignificant (*p*-value = 0.4444).

In this section, we perform a number of additional tests in order to probe the reliability of the reported findings, assess the robustness of our results, and consider alternative explanations.

6.1. Corporate governance

To address concerns that monitoring institutions simply invest in targets that are better governed and, therefore, more likely to earn higher premiums, we conduct a two-part analysis similar to that in Chen, Harford and Li (2007). The first step includes estimating three (untabulated) regressions that use the number of monitoring institutions, the proportion of monitoring institutions, and the total ownership of monitoring institutions as the respective dependent variables. The independent variables in these tests include the target's size, lagged stock return, leverage, Tobin's Q, and the Gompers, Ishii, and Metrick (2003) corporate governance index (G-index), board size (Yermack, 1996) and board ownership (Denis, Denis, and Sarin, 1997) as well as indicators for Delaware incorporation (Daines, 2001), independent boards (Weisbach, 1988), and busy boards (Fich and Shivdasani, 2006). Monitoring ownership is not significantly explained by any of the governance variables. These results do not suggest that institutional monitors tend to systematically hold shares in better performing or better governed companies.

Next, we retain the residuals from the three monitoring institutions tests we estimate in the first step described above. These residuals (which measure the abnormal level of our monitoring institutions proxies) are used as the key independent variables in premium regressions which are specified similar to those in Table 4. Models 1, 2, and 3 of Panel A in Table 9 report the estimates for the abnormal level of monitoring institutions variables. These estimates capture the oversight role by monitoring institutions that is purged from the effect of

either the governance or the performance of the target firm. We find that the abnormal monitoring institutions estimates are positive and significantly associated with the bid premium.

These findings (in tandem with those from the endogeneity tests in Table 7) assuage the concern that our results are the byproduct of institutional monitors investing according to the better governance or the superior performance of the target firms.

6.2. Acquisition premium and acquirer return alternatives

The regressions presented in Table 5 Panel B use the four-week premium reported by SDC as the dependent variable. In untabulated analyses, we re-estimate the same regressions using three different premium measures as dependent variables. The first is the target's CAR during the window (-20, +1) relative to the announcement date as in Jarrell and Poulsen (1989). Our second measure follows Schwert (1996) and uses the target's CAR during the window (-42, +126). Our third measure uses the "combined" merger premium defined in Officer (2003) as the dependent variable.[15] The results of the regressions that use the three alternative measures also document a positive and economically important association between monitoring institutions and the takeover premium. For instance, raising the total ownership of monitoring institutions by one standard deviation is associated with an increase of 3.49% in the combined premium.

We also estimate several regressions similar to those reported in Table 8. In these tests we replace the acquirer's CAR over the (-1, +1) window with (-2, +2) and (-5, +5) CARs. Looking at Panel B of Table 9, we note that the coefficients for the total ownership of monitoring institutions in the target firm are still negatively related to the acquirer's return as measured

[15] Specifically, following Officer (2003), we first estimate a premium based on component data using the aggregate value of cash, stock, and other securities offered by the bidder to target shareholders as reported by SDC. We then estimate premiums based on initial price and final price data, respectively. These prices are also reported by SDC. All premium measures are then deflated by the target's market value 42 trading days prior to the bid announcement. The combined premium is based on the component measure if it is greater than zero and less than two. Otherwise, the premium relies on the initial price measure (or on the final price measure if initial price data are missing).

during these alternative windows. In contrast, estimates for the target blockholder variable do not attain statistical significance at conventional levels.

6.3. Excluding targets in the financial industry

As noted earlier, just over one fifth of the targets in our sample operate in the Financial sector (see Panel A of Table 1). Although all of our multivariate tests include industry fixed-effects, we check whether our results hold if we remove these targets from our regressions. The tests in Panels C and D of Table 9 exclude targets operating in the Financial industry from the analysis. In Panel C of Table 9 we report the coefficients for our monitoring institutions variables from premium regressions similar to those reported in Panel B of Table 5. As with the earlier results, all variables exhibit positive and significant coefficients. Panel D of Table 9 reports estimates for our monitoring institution proxies from acquirer return tests that follow the specification reported in Table 8. The results in Panel D of Table 9 continue to document an inverse association between our monitoring institutions proxies and the return to the bidder firms. In general, the results in Panels C and D of Table 9 alleviate concerns that our findings are driven by observations in the Financial industry.

6.4. Holdings aggregation and institutional size

Institutions aggregate their holdings across funds and report only the combined holdings in their 13F forms. This is unlikely to be a concern in our setting since, within an institution, fund managers might not have similar (monitoring versus trading) objectives, share information, or coordinate effort. Put differently, treating these funds as a single institution most likely biases against our finding a monitoring effect to the extent that multiple funds within the same institution take uncoordinated positions (and actions) in a single firm. On the other hand, aggregation could be a concern if the funds within these institutions coordinate their efforts. This

possibility, together with the fact that larger institutions are more likely to be influential (Basak and Pavlova, 2013), suggests that our results could stem from the large size and influence of these investors.

To evaluate whether aggregation and large institutional investor size could be affecting our results, we begin by ranking the 4,155 institutions in our sample according to the number of funds within the investor. On average, the top 20 institutions have 52 individual funds. In terms of size, these 20 institutions account for 36% of the market value represented by our 4,155 sample institutions during the last quarter ending prior to the acquisition announcement date. After excluding the top 20, the remaining institutions on average have seven individual funds.

In untabulated tests, we eliminate the top 20 institutions from the analyses. The purpose here is not to remove aggregation entirely (this would all but exhaust our sample), but to assess whether there is any change in the results that would suggest that aggregation in general –and institutional size in particular– is a key driver of our results. Removing the top 20 does not qualitatively alter our main findings. The tests that exclude these institutions indicate that increasing the total ownership of monitoring institutions by one standard deviation is associated with (i) a premium increase of 2.75%, and (ii) a decline in the M&A announcement CAR to the acquirer of -0.55%.

6.5. Monitoring institutions of the acquirer

Just as institutions monitor targets in which they have significant holdings, acquirers could be subject to similar oversight by their own monitoring institutions. However, a possible caveat with this conjecture is that most of the bargaining power improvements that would come from shareholder action would be on the target side where shareholder coordination is critical in responding to the proposed merger. With this issue in mind, we recalculate our premium and

acquirer return regressions including an additional explanatory variable: a (0,1) dummy variable set to "1" whenever the acquirer shares are held by at least one monitoring institution. The dummy is set to "0" otherwise. All of our results are robust to the inclusion of this control. Moreover, the dummy variable does not attain significant coefficients in either the premium or the acquirer return regressions.

In untabulated analyses, we also test whether, under oversight by their own monitoring institutions, bidders are more likely to withdraw from bad acquisition deals. To do so, we estimate three logit regressions in which the dependent variable equals one if the deal is withdrawn. The dependent variable is equal to zero otherwise. We also define a bad acquisition (0,1) indicator that is set to one if the merger CAR on the acquirer is negative and statistically significant. For all other CARs the indicator is set to zero. In the three logit regressions we interact the bad acquisition indicator with our three proxies for monitoring institutions of the bidders, respectively. In all tests, the coefficients for the interaction terms are positive but not statistically significant.

6.6. Alternative blockholder measures

In all of our multivariate tests we use the total ownership by blockholders in the target firm to control for the holdings by institutions measured relative to the target firm's outstanding shares. This variable fails to achieve statistical significance in our analyses. We repeat all of our multivariate tests replacing the blockholder ownership with (i) the number of blockholders, (ii) the proportion of blockholders, (iii) the ownership by the largest five institutions, and (iv) the ownership of the largest institution. None of these alternative measures of institutional ownership in the target firm attains significant coefficients. In contrast, our monitoring institution proxies continue to obtain statistically significant estimates in all tests.

6.7. Cross-holdings

Our results show that institutions for which the target constitutes a top ten holding are associated with higher premiums paid for the targets and with lower acquirer returns. Matvos and Ostrovsky (2008) argue that gains on target shares held by the bidder's institutional investors more than offset their losses on bidder shares. To consider this possibility, for each target in our sample, we perform a shareholder-by-shareholder analysis. This test shows that monitoring institutions do not generally hold shares of the bidder firm, and in the few cases in which they do, they tend to have very small stakes. These results are consistent with the findings on cross-holdings of Harford, Jenter and Li (2011), who show that in very few instances cross-holding institutions have large stakes in both the bidder and target. Given this, it is unlikely that cross-holdings explain our results. Nonetheless, we rerun our target premium and acquirer return tests controlling for the presence of cross-holdings. Such control does not alter our results.

6.8. Banding rule affecting index reconstitutions

Chang, Hong and Liskovich (2013) note that, after 2007, Russell Inc. followed a more complicated rule to limit switching around the upper cut-off of the Russell 2000. Essentially, a stock could only change indices if it moved far enough beyond the 1000 cut-off. Under this rule known as "banding," if two stocks (on the periphery of the threshold) are supposed to switch places in year *t*, Russell may leave them in their *t-1* index if the market value differential is small.

Due to the banding rule, we repeat the tests presented in Table 7 excluding all deals that occur on or after 2007. All of our results continue to hold. The (untabulated) coefficients for the parameter estimates of the second stage premium regressions related to the change in the number of monitoring institutions, the change in the proportion of monitoring institutions, and the change

in the total ownership of monitoring institutions are 0.03 (p-value = 0.0001), 5.08 (p-value = 0.0001) and 0.26 (p-value = 0.0001), respectively.

7. Summary and conclusions

Several studies theorize that through activism, intervention and monitoring, large shareholders (such as institutional investors) can enhance the value of the firm (Shleifer and Vishny, 1986; Maug, 1998; Kahn and Winton, 1998). Nonetheless, empirical evidence on the purported role of institutions in improving shareholder wealth is mixed. In a survey of the literature, Holderness (2003) asserts that with the exception of the form (and level) of executive compensation, few major corporate decisions have been shown to be different in the presence of blockholders. He notes that academic studies have not definitely established whether the impact of blockholders on firm value is positive or negative. We argue that the lack of academic consensus in assessing the impact of institutional ownership on shareholder wealth stems from the way the ownership is typically measured. Specifically, most studies track institutional ownership relative to a public firm's outstanding common equity. The logic behind this measure is that the more equity the institution holds, the more likely it is that the firm will pay attention to this investor. This logic, however, ignores the possibility that even if the firm has to pay attention to an institution – because the latter holds an important block of the firm's shares – the institution may not be interested in monitoring it. This could happen because, relative to the institution's own portfolio, the firm may not be an important holding.

To investigate this issue, in this paper we propose a new way to proxy for the effect of institutional investors: we measure institutional ownership relative to the institution's entire portfolio. We hypothesize that the more funds an institution invests in a given firm, the more

likely the institution is to monitor that firm. Based on this premise, we define monitoring institutions as those for which the firm constitutes a top ten portfolio holding.

We test our hypotheses in the context of acquisitions. This choice is motivated by the fact that acquisitions are notable investments in which the incentives of managers and investors are not always aligned.

Our results show that in M&A transactions monitoring institutions of the target firm are associated with (i) a higher probability of deal completion, (ii) a higher bid premium offered for the target firm, (iii) an increased likelihood that the bid for the target firm is revised upward, and (iv) a lower acquirer return. These findings support the view that institutional monitoring heightens when the target firm represents a top allocation of funds in the institution's portfolio.

By proposing a better measure of the relevant shareholdings for activist investors in a firm and by showing the net impact of such monitors on M&A deals, our study has broad implications for the literature studying the effect of institutional ownership on firm value. Our findings show that our monitoring institutions proxies better capture the influence and potential activism by institutional investors. We show that a firm is likely to listen to a monitoring institution even if this investor is not a blockholder. This could happen because, otherwise, the institution will try to coordinate with other investors (in order to have its voice heard) or will sell its stake. Both of these alternatives may attract unfavorable attention to the firm and its managers.

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Table 1: M&A sample characteristics

This table describes our sample which consists of 1,601 merger and acquisition bids by U.S. bidders for U.S. targets announced during 1984-2011 and tracked in the Securities Data Company's (SDC) merger and acquisition database. We screen deals from SDC following the criteria in Moeller, Schlingemann, and Stulz (2004) and Masulis, Wang, and Xie (2007). In addition, we require that both acquirer and target firms have stock market, accounting, and institutional ownership data available from the Center for Research in Security Prices (CRSP), Compustat, and Thomson 13F, respectively. In Panel A we report the temporal and Fama and French 48 industrial distribution of the sample targets. In Panel B we report deal status, mode of acquisition, method of payment, deal attitude, deal value, and target financial characteristics. All financial variables are measured at the end of the fiscal year before the merger public announcement date and inflation-adjusted to the end of 2011.

Panel A: Temporal and industrial distribution

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Deal count	28	26	18	20	37	33	17	15	11	22
Percent	1.75	1.62	1.12	1.25	2.31	2.06	1.06	0.94	0.69	1.37
Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Deal count	45	56	71	77	89	158	123	120	68	82
Percent	2.81	3.5	4.43	4.81	5.56	9.87	7.68	7.5	4.25	5.12
Year	2004	2005	2006	2007	2008	2009	2010	2011		Total
Deal count	77	75	78	78	46	41	62	28		1,601
Percent	4.81	4.68	4.87	4.87	2.87	2.56	3.87	1.75		100

Industry	Count	%	Industry	Count	%
Agriculture	1	0.06	Shipbuilding, Railroad Equipment	6	0.37
Food Products	17	1.06	Defense	2	0.12
Candy & Soda	2	0.12	Precious Metals	7	0.44
Beer & Liquor	3	0.19	Industrial Metal Mining	2	0.12
Tobacco Products	1	0.06	Petroleum and Natural Gas	56	3.50
Recreation	12	0.75	Utilities	47	2.94
Entertainment	21	1.31	Communication	45	2.81
Printing and Publishing	5	0.31	Personal Services	3	0.19
Consumer Goods	20	1.25	Business Services	195	12.18
Apparel	8	0.50	Computer Hardware	94	5.87
Healthcare	28	1.75	Computer Software	86	5.37
Medical Equipment	70	4.37	Measuring and Control Equipment	46	2.87
Pharmaceutical Products	71	4.43	Business Supplies	18	1.12
Chemicals	17	1.06	Shipping Containers	5	0.31
Rubber and Plastic Products	14	0.87	Transportation	28	1.75
Textiles	5	0.31	Wholesale	28	1.75
Construction Materials	21	1.31	Retail	65	4.06
Construction	12	0.75	Restaurants, Hotels, Motels	12	0.75
Steel work	14	0.87	Banking	349	21.80
Fabricated Products	3	0.19	Insurance	36	2.25
Machinery	37	2.31	Real Estate	8	0.50
Electrical Equipment	4	0.25	Trading	52	3.25
Automobiles and Trucks	11	0.69	Others	7	0.44
Aircraft	7	0.44	Total	1,601	100

Panel B: Deal and firm characteristics

	N	Proportion of sample		Mean	Median
Deal characteristics					
Completed	1,601	0.8339	(1,335)		
Tender offer	1,601	0.1805	(289)		
Stock only	1,601	0.3042	(487)		
Cash only	1,601	0.3348	(536)		
Friendly attitude	1,601	0.9113	(1,459)		
Same industry	1,601	0.6658	(1,066)		
Deal value (US$ billion)	1,601			1.4853	0.2342
Relative size (Target/Acquirer)	1,601			0.3476	0.1188
Target characteristics					
Market value of equity (US$ billion)	1,601			0.8321	0.1155
Q	1,601			1.8331	1.2146
Leverage	1,601			0.2139	0.1547

Table 2: Targets' institutional monitoring proxies

In this table we report summary statistics of the target firms' institutional monitoring proxies.

We report the 5 variables traditionally used in the literature to proxy for institutional monitoring.

1. Number of blockholders: the number of institutions whose ownership in the target is at least 5% of the target's shares outstanding
2. Proportion of blockholders: the proportion of blockholders among all institutions holding the target's shares
3. Total ownership of blockholders: the total ownership of blockholders on the target's total shares outstanding
4. Total ownership of the five largest institutions: the total share ownership controlled by the five largest institutional investors in the target
5. Ownership of the largest institution: the share ownership controlled by the largest institutional investor in the target

We assume that institutions allocate their effort to a portfolio firm (here the target firm) based on the relative importance of their holding of the target's stock in the portfolio. *We define monitoring institutions as those whose holding value in the target is in the top 10% of their portfolio.* We use 3 proxies of the target's institutional monitoring:

1. Number of monitoring institutions: the number of institutions whose holding value in the target is in the top 10% of the institution's portfolio
2. Proportion of monitoring institutions: the proportion of monitoring institutions among all institutions holding the target's shares
3. Total ownership of monitoring institutions: the total ownership of monitoring institutions as a proportion of the target's total shares outstanding

In Panel A, we report summary statistics for each institutional monitoring proxy for 1,601 sample targets and portfolio characteristics for 4,155 institutions holding shares in these targets during the last quarter end before the merger public announcement. In Panel B, we report the sample mean for each institutional monitoring proxy each year during 1984-2011.

Panel A: Institutional ownership characteristics	Mean	Median	Q1	Q3	σ
Targets' institutional blockholder measures: Traditional					
Number of institutional blockholders	1.4553	1.0000	0.0000	2.0000	1.4281
Proportion of institutional blockholders	0.0545	0.0196	0.0000	0.0645	0.0939
Total ownership of institutional blockholders	0.1266	0.0916	0.0000	0.1995	0.1328
Total ownership of the five largest institutions	0.2051	0.1971	0.1087	0.2880	0.1278
Ownership of the largest institution	0.0804	0.0719	0.0418	0.1024	0.0624
Target's institutional monitoring proxies: New					
Number of monitoring institutions	4.1224	0.0000	0.0000	2.0000	15.7879
Proportion of monitoring institutions	0.0243	0.0000	0.0000	0.0370	0.0418
Total ownership of monitoring institutions	0.0683	0.0000	0.0000	0.0913	0.1221
Conditional on at least one monitoring institution					
Number of monitoring institutions	9.4828	3.0000	1.0000	8.0000	22.8675
Proportion of monitoring institutions	0.0559	0.0424	0.0256	0.0696	0.0475
Total ownership of monitoring institutions	0.1572	0.1086	0.0534	0.2069	0.1426
Institutions' portfolio holdings					
Number of monitored portfolio companies	24.4080	10.8000	5.6000	24.5000	39.9456
Proportion of monitored portfolio market value	0.4280	0.4018	0.2960	0.5442	0.1788

Panel B: Mean institutional ownership by year

			Traditional institutional blockholder measures						New institutional monitoring proxies		
Year	Deal count	Targets with institutional blockholders	Number of institutional blockholders	Proportion of institutional blockholders	Total ownership of institutional blockholders	Total ownership of the five largest institutions	Ownership of the largest institution	Targets with monitoring institutions	Number of monitoring institutions	Proportion of monitoring institutions	Total ownership of monitoring institutions
1984	28	12	2	0.0732	0.0538	0.1224	0.0534	9	5	0.0245	0.0238
1985	26	11	1	0.0666	0.0412	0.1188	0.0489	12	6	0.0369	0.0494
1986	18	13	2	0.1387	0.1219	0.1860	0.0813	8	1	0.0309	0.0399
1987	20	10	2	0.0537	0.0681	0.1687	0.0610	11	3	0.0380	0.0626
1988	37	20	2	0.0947	0.0867	0.1618	0.0741	12	2	0.0184	0.0388
1989	33	14	1	0.0543	0.0541	0.1349	0.0620	8	10	0.0205	0.0465
1990	17	10	1	0.0277	0.0543	0.1411	0.0539	6	5	0.0177	0.0226
1991	15	8	1	0.0348	0.0579	0.1222	0.0512	4	6	0.0136	0.0397
1992	11	6	2	0.0303	0.0928	0.1655	0.0749	4	6	0.0177	0.0384
1993	22	13	1	0.0879	0.0887	0.1737	0.0812	9	3	0.0246	0.0513
1994	45	24	2	0.0526	0.0827	0.1622	0.0610	10	7	0.0146	0.0405
1995	56	40	2	0.0912	0.1208	0.2041	0.0865	21	4	0.0233	0.0631
1996	71	50	2	0.0717	0.1373	0.2191	0.0840	26	6	0.0211	0.0652
1997	77	49	2	0.0459	0.1171	0.1961	0.0772	37	8	0.0310	0.0820
1998	89	58	2	0.0702	0.1276	0.1965	0.0772	31	10	0.0234	0.0687
1999	158	106	2	0.0485	0.1178	0.1967	0.0745	80	10	0.0308	0.0803
2000	123	83	2	0.0467	0.1127	0.1877	0.0765	49	9	0.0225	0.0554
2001	120	69	2	0.0478	0.1130	0.1838	0.0792	38	9	0.0160	0.0538
2002	68	46	2	0.0684	0.1413	0.2134	0.0986	21	13	0.0156	0.0414
2003	82	59	2	0.0649	0.1509	0.2224	0.0947	31	10	0.0184	0.0604
2004	77	53	2	0.0367	0.1082	0.1927	0.0701	36	10	0.0218	0.0643
2005	75	64	3	0.0508	0.1797	0.2541	0.0907	41	13	0.0308	0.1008
2006	78	66	2	0.0370	0.1659	0.2609	0.0934	56	11	0.0339	0.1158
2007	78	63	2	0.0336	0.1581	0.2444	0.0832	41	7	0.0233	0.0796
2008	46	41	3	0.0666	0.2002	0.2756	0.1021	20	19	0.0330	0.1028
2009	41	30	3	0.0465	0.1811	0.2602	0.0991	20	21	0.0271	0.0748
2010	62	45	3	0.0297	0.1652	0.2526	0.0963	39	8	0.0245	0.0978
2011	28	22	3	0.0336	0.1509	0.2397	0.0718	16	12	0.0249	0.0793
All	1,601	1,085	2	0.0545	0.1266	0.2051	0.0804	696	9	0.0243	0.0683

Table 3: Targets' institutional monitoring and deal completion

The sample consists of 1,601 mergers and acquisitions announced during 1984-2011 described in Table 1. We estimate logit regressions of merger completion probability similar to those in Officer (2003). The dependent variable equals one if the proposed bid is completed. The main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Deal completion (0,1)			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	-0.4636	-0.2963	-0.6639	-1.1742
	(0.5278)	(0.6891)	(0.3704)	(0.1265)
Targets' institutional monitoring proxies				
Number of monitoring institutions		0.0166**		
		(0.0416)		
Proportion of monitoring institutions			8.8989***	
			(0.0013)	
Total ownership of monitoring institutions				3.6886***
				(0.0008)
Deal and market characteristics				
Target termination fee (0,1)	1.8968***	1.9286***	1.9279***	1.9301***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lockup (0,1)	-0.1004	-0.0680	-0.0631	-0.0967
	(0.8653)	(0.9091)	(0.9179)	(0.8741)
Competed deal (0,1)	-2.1000***	-2.1695***	-2.1769***	-2.1671***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Toehold (0,1)	0.2048	0.2000	0.2530	0.2356
	(0.5807)	(0.5910)	(0.4978)	(0.5285)
Cash only payment (0,1)	0.0227	0.0289	0.0186	0.0339
	(0.9212)	(0.9001)	(0.9358)	(0.8836)
Stock only payment (0,1)	0.3641*	0.3440	0.3209	0.3575*
	(0.0912)	(0.1118)	(0.1393)	(0.0994)
Tender offer (0,1)	1.3372***	1.4095***	1.3996***	1.4064***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Hostile deal (0,1)	-2.1979***	-2.2558***	-2.2796***	-2.3088***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Merger of equals (0,1)	-0.6966	-0.7748	-0.7249	-0.7178
	(0.3413)	(0.2992)	(0.3336)	(0.3358)
Same industry (0,1)	0.4486**	0.4559**	0.4764**	0.4788**
	(0.0180)	(0.0168)	(0.0129)	(0.0125)
Relative size (Target / Acquirer)	-0.2562**	-0.2392**	-0.2378**	-0.2547**
	(0.0329)	(0.0465)	(0.0473)	(0.0364)
Target CAR [-1,+1]	0.2321*	0.2161*	0.2528*	0.2678*
	(0.0559)	(0.0587)	(0.0527)	(0.0504)
Target's size	0.0003	-0.0787	-0.1358*	-0.1507**
	(0.9959)	(0.2330)	(0.0552)	(0.0370)
Target industry liquidity index	0.2958	0.3243	0.3291	0.3177
	(0.5230)	(0.4870)	(0.4828)	(0.4987)
One year macroeconomic change	0.0140	0.0097	0.0017	0.0149
	(0.8315)	(0.8831)	(0.9789)	(0.8208)
Constant	-0.1817	0.1197	0.4822	0.5472
	(0.8656)	(0.9123)	(0.6618)	(0.6210)
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 4: Targets' institutional monitoring and bid revision

The sample consists of 1,601 mergers and acquisitions announced during 1984-2011 described in Table 1. We estimate logit regressions of bid revision probabilities similar to those in Bates, Lemmon, and Linck (2006). The dependent variable equals one if there is a revision of the bid price in Model (1), downward price revision in Model (2), and upward revision in Models (3)-(5). The main independent variable is the total ownership of monitoring institutions in Models (1)-(3), the number of monitoring institutions in Model (4), and the proportion of monitoring institutions among all target's institutions in Model (5). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent var = Bid revision (0,1)	All	Downward	Upward	Upward	Upward
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**
Total inst blockholder ownership	0.6798	-0.1866	0.7269	1.4354	1.1152
	(0.3917)	(0.8921)	(0.5371)	(0.2229)	(0.3412)
Targets' inst monitoring proxies					
Total ownership of monitor inst	1.9506**	1.0505	2.5167**		
	(0.0283)	(0.5515)	(0.0122)		
Number of monitoring inst				0.0170**	
				(0.0449)	
Proportion of monitoring inst					5.8901**
					(0.0363)
Deal and market characteristics					
Target termination fee (0,1)	-0.1247	-0.0656	-0.0553	0.0059	-0.0324
	(0.5899)	(0.8638)	(0.8466)	(0.9837)	(0.9094)
Lockup (0,1)	-1.2376	-5.7726	-0.8244	-0.5207	-0.6224
	(0.2627)	(0.8017)	(0.4746)	(0.6465)	(0.5840)
Competed deal (0,1)	1.3258***	-7.1130	2.1357***	2.1587***	2.1371***
	(0.0001)	(0.5055)	(0.0001)	(0.0001)	(0.0001)
Toehold (0,1)	0.5189	0.5456	0.4959	0.4488	0.4375
	(0.1822)	(0.3407)	(0.2960)	(0.3471)	(0.3566)
Cash only payment (0,1)	-0.1466	-0.2155	-0.1174	-0.1209	-0.1401
	(0.5864)	(0.6317)	(0.7215)	(0.7143)	(0.6703)
Stock only payment (0,1)	0.2103	-0.3209	0.5141	0.5338	0.4778
	(0.4181)	(0.4222)	(0.1200)	(0.1077)	(0.1477)
Tender offer (0,1)	0.1484	-0.5236	0.4726	0.5000	0.4950
	(0.6141)	(0.3439)	(0.1695)	(0.1465)	(0.1506)
Hostile deal (0,1)	3.7279***	2.0350***	4.0183***	4.1349***	4.0746***
	(0.0001)	(0.0011)	(0.0001)	(0.0001)	(0.0001)
Merger of equals (0,1)	-0.3710	-5.4035	-0.1635	-0.3561	-0.1538
	(0.7396)	(0.8617)	(0.8891)	(0.7655)	(0.8954)
Same industry (0,1)	0.4435*	0.0548	0.5020*	0.4738	0.4834
	(0.0592)	(0.8806)	(0.0883)	(0.1072)	(0.1004)
Relative size (Target / Acquirer)	0.0212	0.1126	-0.2017	-0.1761	-0.1752
	(0.6657)	(0.1818)	(0.4051)	(0.4288)	(0.4356)
Target's size	0.0000	-0.0001	0.0000	0.0000	0.0000
	(0.1199)	(0.3358)	(0.4362)	(0.3547)	(0.5110)
Target industry liquidity index	0.0473	-1.3563	0.5734	0.6019	0.6192
	(0.9242)	(0.1358)	(0.3380)	(0.3120)	(0.2984)
One year macroeconomic change	0.0947	0.3410**	0.0123	0.0121	0.0107
	(0.1938)	(0.0213)	(0.8931)	(0.8947)	(0.9061)
ln (Initial offer premium)	-0.1404	-0.1228	-0.1355	-0.1581	-0.1463
	(0.2256)	(0.5162)	(0.3431)	(0.2620)	(0.3026)
Constant	-10.9710	-9.6006	-11.3341	-10.9236	-11.0186
	(0.9562)	(0.9634)	(0.9568)	(0.9589)	(0.9577)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001	0.0001

Table 5: Targets' institutional monitoring and acquisition premiums

Panel A presents first stage regressions of the probability of becoming a takeover target using 154,227 firm-years with data from CRSP and Compustat during fiscal year 1983-2011. These tests are similar to those in Palepu (1986). Standard errors are clustered at the firm level. In Panel B we estimate OLS regressions of merger premiums similar to those in Bargeron, Schlingemann, Stulz, and Zutter (2008). The dependent variable is the final offer premium reported by SDC. The main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). The sample consists of 1,601 mergers and acquisitions described in Table 1. We include the inverse Mill's ratio obtained from the first stage test to control for target self-selection (Heckman, 1979). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Probability of becoming a target

	Dependent variable = Target (0,1)			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	-0.1893	-0.2368	-0.1734	-0.0963
	(0.2004)	(0.1113)	(0.2414)	(0.5284)
Number of monitoring institutions		-0.0032**		
		(0.0198)		
Proportion of monitoring institutions			-1.1854**	
			(0.0225)	
Total ownership of monitoring institutions				-0.5595**
				(0.0123)
Size	-0.3545***	-0.4021***	-0.3979***	-0.4013***
	(0.0009)	(0.0002)	(0.0002)	(0.0002)
Q	0.0313*	0.0186	0.0257*	0.0244
	(0.0507)	(0.1322)	(0.0962)	(0.1130)
Leverage	-0.0022	0.0127	0.0160	0.0202
	(0.8523)	(0.3320)	(0.2535)	(0.1647)
Liquidity	0.0630***	0.0559**	0.0563**	0.0538***
	(0.0052)	(0.0153)	(0.0139)	(0.0199)
OCF	-0.0628	-0.0363	-0.1027*	-0.1097*
	(0.2902)	(0.1363)	(0.0920)	(0.0733)
Prior year market adjusted return	-0.0065	-0.0065	-0.0064	-0.0062
	(0.1378)	(0.1410)	(0.1464)	(0.1643)
Target Herfindahl-Hirschman Index	0.5589	0.5849	0.5805	0.6154
	(0.3408)	(0.3194)	(0.3228)	(0.2953)
Target industry liquidity index	0.3445	0.3532	0.3467	0.3386
	(0.1816)	(0.1707)	(0.1785)	(0.1890)
One year macroeconomic change	0.0109	0.0112	0.0110	0.0108
	(0.5278)	(0.5165)	(0.5226)	(0.5301)
Constant	-78.8002	-46.5774	-127.1627*	-136.8273
	(0.2722)	(0.1116)	(0.0855)	(0.1566)
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	154,227	154,227	154,227	154,227
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Panel B: Targets' institutional monitoring and acquisition premiums

	Dependent variable = Acquisition premium			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	0.0463	0.0592	0.0251	0.0067
	(0.5308)	(0.4230)	(0.7336)	(0.9313)
Targets' institutional monitoring proxies				
Number of monitoring institutions		0.0016**		
		(0.0193)		
Proportion of monitoring institutions			0.9722***	
			(0.0007)	
Total ownership of monitoring institutions				0.2388**
				(0.0234)
Target characteristics				
Size	-0.0366***	-0.0448***	-0.0517***	-0.0474***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Q	0.0000	0.0000	0.0000	0.0000
	(0.9468)	(0.9933)	(0.9280)	(0.9698)
Leverage	-0.0813	-0.0775	-0.0724	-0.0771
	(0.2113)	(0.2334)	(0.2647)	(0.2358)
Liquidity	0.0742*	0.0859**	0.0873***	0.0866***
	(0.0688)	(0.0124)	(0.0055)	(0.0098)
OCF	-0.0321	-0.0302	-0.0308	-0.0313
	(0.5711)	(0.5927)	(0.5847)	(0.5803)
Prior year market adjusted return	-0.0623***	-0.0630***	-0.0730***	-0.0672***
	(0.0002)	(0.0002)	(0.0001)	(0.0001)
Acquirer characteristics				
Q	0.0000	0.0000	0.0001	0.0000
	(0.9396)	(0.8786)	(0.7560)	(0.8385)
Leverage	0.0549	0.0619	0.0640	0.0639
	(0.4723)	(0.4176)	(0.4013)	(0.4029)
Liquidity	0.0133	0.0182	0.0175	0.0173
	(0.5497)	(0.4152)	(0.4312)	(0.4380)
OCF	0.0255	0.0204	0.0197	0.0234
	(0.6618)	(0.7260)	(0.7348)	(0.6880)
Prior year market adjusted return	0.0208	0.0202	0.0179	0.0190
	(0.1793)	(0.1904)	(0.2463)	(0.2191)
Deal and market characteristics				
Relative size (Target / Acquirer)	-0.0170**	-0.0164**	-0.0158**	-0.0162**
	(0.0204)	(0.0253)	(0.0306)	(0.0268)
Cash only payment (0,1)	0.0518**	0.0534**	0.0534**	0.0536**
	(0.0335)	(0.0279)	(0.0276)	(0.0276)
Stock only payment (0,1)	0.0229	0.0237	0.0227	0.0252
	(0.3360)	(0.3185)	(0.3372)	(0.2882)
Tender offer (0,1)	0.0843***	0.0878***	0.0878***	0.0877***
	(0.0022)	(0.0015)	(0.0014)	(0.0015)
Hostile deal (0,1)	0.0490	0.0483	0.0444	0.0436
	(0.2871)	(0.2932)	(0.3328)	(0.3431)
Competed deal (0,1)	0.1319***	0.1282***	0.1278***	0.1308***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Toehold (0,1)	-0.0372	-0.0357	-0.0348	-0.0364
	(0.3829)	(0.4024)	(0.4127)	(0.3935)
Target termination fee (0,1)	0.0425*	0.0479**	0.0464**	0.0448**
	(0.0584)	(0.0333)	(0.0381)	(0.0458)
Lockup (0,1)	-0.0289	-0.0259	-0.0335	-0.0332
	(0.6939)	(0.7239)	(0.6469)	(0.6503)
Same industry (0,1)	0.0188	0.0199	0.0188	0.0203
	(0.3566)	(0.3278)	(0.3562)	(0.3194)

Merger of equals (0,1)	-0.2047**	-0.2154**	-0.2098**	-0.2084**
	(0.0264)	(0.0194)	(0.0224)	(0.0236)
Target Herfindahl-Hirschman Index	-0.4174	-0.4534	-0.4461	-0.4604
	(0.2607)	(0.2216)	(0.2279)	(0.2148)
Target industry liquidity index	0.0485	0.0533	0.0521	0.0496
	(0.3348)	(0.2890)	(0.2992)	(0.3234)
One year macroeconomic change	-0.0247***	-0.0248***	-0.0255***	-0.0248***
	(0.0004)	(0.0004)	(0.0003)	(0.0004)
Constant	0.5648***	0.5847***	0.6233***	0.6093***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Heckman self-selectivity correction	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 6: Targets' institutional monitoring and unconditional premiums

This table presents unconditional premium regressions similar to those in Comment and Schwert (1995). The dependent variable is the acquisition premium reported by SDC. The premium is set to zero in non-takeover firm-years. All models use 154,227 firm-years with data available from CRSP and Compustat during fiscal year 1983-2011. The main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). All variables are defined in the appendix. Standard errors are clustered at the firm level. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Acquisition premium			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	0.0001	0.0001	0.0001	0.0001
	(0.9254)	(0.9245)	(0.9247)	(0.8997)
Targets' institutional monitoring proxies				
Number of monitoring institutions		0.0000		
		(0.8570)		
Proportion of monitoring institutions			-0.0014	
			(0.9297)	
Total ownership of monitoring institutions				-0.0006
				(0.8501)
Size	-0.0008**	-0.0008**	-0.0008*	-0.0008*
	(0.0362)	(0.0468)	(0.0844)	(0.0531)
Q	0.0000	0.0000	0.0000	0.0000
	(0.9186)	(0.9186)	(0.9182)	(0.9187)
Leverage	0.0135***	0.0135***	0.0135***	0.0136***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Liquidity	0.0004	0.0003	0.0004	0.0004
	(0.6216)	(0.6436)	(0.6164)	(0.6148)
OCF	0.0000	0.0000	0.0000	0.0000
	(0.9918)	(0.9911)	(0.9921)	(0.9921)
Prior year market adjusted return	0.0000	0.0000	0.0000	0.0000
	(0.6877)	(0.6889)	(0.6879)	(0.6887)
Target Herfindahl-Hirschman Index	-0.0122	-0.0124	-0.0121	-0.0122
	(0.5246)	(0.5201)	(0.5283)	(0.5266)
Target industry liquidity index	-0.0064	-0.0064	-0.0064	-0.0064
	(0.5101)	(0.5107)	(0.5100)	(0.5099)
One year macroeconomic change	0.0001	0.0001	0.0001	0.0001
	(0.6643)	(0.6619)	(0.6646)	(0.6671)
Constant	-0.0014	-0.0012	-0.0015	-0.0015
	(0.7296)	(0.7580)	(0.7214)	(0.7145)
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	154,227	154,227	154,227	154,227
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 7: Endogeneity of institutional monitoring and acquisition premiums

This table addresses the endogeneity of institutional monitoring and the acquisition premiums using a regression discontinuity approach around index reconstitutions. The specification is similar to that in Schmidt (2013). Model (1) presents the first stage regression of the change in the number of monitoring institutions on target characteristics and Russell index inclusions using 154,227 firm-years with data from CRSP and Compustat during fiscal year 1983-2011. Model (2) presents the second stage regression of the acquisition premium on the predicted change in the number of monitoring institutions obtained from the first stage. Model (3) presents the regular regression of the acquisition premium on the change in the number of monitoring institutions. We use the proportion of monitoring institutions among all target's institutions in Models (4) and (5), and the total ownership of monitoring institutions in Models (6) and (7). In Models (2) to (7), the sample consists of 1,601 mergers and acquisitions described in Table 1. All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Number of monitoring institutions			*Proportion of monitoring institutions*		*Ownership of monitoring institutions*	
Dependent variable =	Change in number of monitoring inst.	Premium	Premium	Premium	Premium	Premium	Premium
	1st stage	2nd stage IV	OLS	2nd stage IV	OLS	2nd stage IV	OLS
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**	**Model (7)**
Change in number of monitoring inst $_{(t-1,\,t)}$		0.0317***	0.0003				
		(0.0001)	(0.9226)				
Change in proportion of monitoring inst $_{(t-1,\,t)}$				5.5829***	-0.6978		
				(0.0001)	(0.2006)		
Change in total ownership of monitoring inst $_{(t-1,\,t)}$						0.2866***	-0.2035
						(0.0001)	(0.2220)
Russell index inclusion of target							
Russell 1000 $_{t-1}$ → Russell 2000 $_{t}$	-1.0309***						
	(0.0001)						
Russell 2000 $_{t-1}$ → No index $_{t}$	-0.1641*						
	(0.0918)						
Russell 2000 $_{t-1}$ → Russell 1000 $_{t}$	0.2261						
	(0.2863)						
No index $_{t-1}$ → Russell 2000 $_{t}$	-0.2435*						
	(0.0975)						
Change in ranking in Russell $_{(t-1,\,t)}$	0.0000						
	(0.2031)						
[Change in ranking in Russell $_{(t-1,\,t)}$]^2	0.0000						
	(0.2602)						

Target characteristics							
Total institutional blockholder ownership	-0.0001	0.0631	0.0687	0.0664	0.0704	0.0651	0.0743
	(0.9876)	(0.3752)	(0.5613)	(0.3549)	(0.5507)	(0.3616)	(0.5295)
Size	0.5587***	-0.0244***	-0.0187*	-0.0237***	-0.0189*	-0.0245***	-0.0185*
	(0.0001)	(0.0006)	(0.0840)	(0.0010)	(0.0885)	(0.0006)	(0.0871)
Q	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.4090)	(0.7951)	(0.9206)	(0.8069)	(0.9058)	(0.8328)	(0.9308)
Leverage	-2.2110***	-0.1036*	-0.0632	-0.1053*	-0.0730	-0.1017*	-0.0677
	(0.0001)	(0.0798)	(0.5100)	(0.0776)	(0.4460)	(0.0865)	(0.4795)
Liquidity	-0.3403***	0.0552***	0.0617***	0.0560***	0.0616***	0.0556***	0.0618***
	(0.0001)	(0.0001)	(0.0095)	(0.0001)	(0.0094)	(0.0001)	(0.0092)
OCF	0.0003	-0.0579	-0.1847**	-0.0563	-0.1845**	-0.0549	-0.1849**
	(0.7466)	(0.2389)	(0.0263)	(0.2570)	(0.0262)	(0.2652)	(0.0260)
Prior year market adjusted return	0.0104**	-0.0707***	-0.0508*	-0.0695***	-0.0492*	-0.0703***	-0.0527*
	(0.0142)	(0.0001)	(0.0700)	(0.0001)	(0.0784)	(0.0001)	(0.0601)
Acquirer characteristics							
Q		0.0001	0.0000	0.0001	0.0000	0.0001	0.0000
		(0.7257)	(0.9198)	(0.7570)	(0.9665)	(0.7289)	(0.9322)
Leverage		0.0418	-0.0561	0.0407	-0.0576	0.0361	-0.0594
		(0.5700)	(0.6531)	(0.5836)	(0.6431)	(0.6240)	(0.6335)
Liquidity		0.0275	0.0301	0.0290	0.0286	0.0289	0.0280
		(0.2054)	(0.4479)	(0.1857)	(0.4677)	(0.1834)	(0.4781)
OCF		0.0700	0.0095	0.0638	0.0211	0.0656	0.0193
		(0.2123)	(0.9233)	(0.2598)	(0.8306)	(0.2433)	(0.8450)
Prior year market adjusted return		0.0191	0.0187	0.0169	0.0167	0.0174	0.0184
		(0.2010)	(0.4481)	(0.2623)	(0.4965)	(0.2437)	(0.4524)
Deal and market characteristics							
Relative size (Target / Acquirer)		-0.0183**	-0.0175**	-0.0189***	-0.0165*	-0.0186**	-0.0170**
		(0.0110)	(0.0307)	(0.0069)	(0.0747)	(0.0101)	(0.0472)
Cash only payment (0,1)		0.0397**	0.0406**	0.0342**	0.0392**	0.0399**	0.0389**
		(0.0304)	(0.0311)	(0.0391)	(0.0427)	(0.0300)	(0.0482)
Stock only payment (0,1)		0.0202	0.0019	0.0223	0.0031	0.0191	0.0023
		(0.3765)	(0.9595)	(0.3348)	(0.9345)	(0.4051)	(0.9513)
Tender offer (0,1)		0.0922***	0.0997**	0.0935***	0.1015**	0.0917***	0.1007**
		(0.0005)	(0.0302)	(0.0005)	(0.0271)	(0.0006)	(0.0285)
Hostile deal (0,1)		0.0428	0.1235	0.0433	0.1422	0.0432	0.1271
		(0.3280)	(0.1575)	(0.3266)	(0.1060)	(0.3252)	(0.1457)

Competed deal (0,1)		0.1272***	0.1566**	0.1256***	0.1516**	0.1254***	0.1561**
		(0.0002)	(0.0162)	(0.0002)	(0.0199)	(0.0002)	(0.0165)
Toehold (0,1)		-0.0208	-0.0435	-0.0252	-0.0427	-0.0218	-0.0425
		(0.6129)	(0.6341)	(0.5443)	(0.6397)	(0.5970)	(0.6421)
Target termination fee (0,1)		0.0405*	0.0662*	0.0423*	0.0676**	0.0408*	0.0669*
		(0.0585)	(0.0548)	(0.0501)	(0.0493)	(0.0569)	(0.0519)
Lockup (0,1)		-0.0448	0.0441	-0.0489	0.0615	-0.0483	0.0478
		(0.5268)	(0.8043)	(0.4932)	(0.7296)	(0.4958)	(0.7880)
Same industry (0,1)		0.0150	0.0155	0.0159	0.0177	0.0137	0.0165
		(0.4458)	(0.6363)	(0.4231)	(0.5878)	(0.4870)	(0.6142)
Merger of equals (0,1)		-0.1909**	-0.2479*	-0.1970**	-0.2561*	-0.1953**	-0.2542*
		(0.0315)	(0.0729)	(0.0279)	(0.0634)	(0.0282)	(0.0657)
Target Herfindahl-Hirschman Index	2.7874***	-0.5779	-0.6516	-0.5645	-0.6415	-0.5581	-0.6422
	(0.0002)	(0.1070)	(0.3884)	(0.1187)	(0.3942)	(0.1204)	(0.3941)
Target industry liquidity index	0.2912	0.0339	0.0901	0.0416	0.0938	0.0385	0.0942
	(0.4168)	(0.4843)	(0.2688)	(0.3959)	(0.2486)	(0.4287)	(0.2474)
One year macroeconomic change	0.0796***	-0.0247***	-0.0307***	-0.0240***	-0.0312***	-0.0237***	-0.0314***
	(0.0001)	(0.0003)	(0.0065)	(0.0004)	(0.0056)	(0.0005)	(0.0054)
Constant	-2.1904***	0.3800***	0.4365**	0.3691***	0.4279**	0.3803***	0.4278**
	(0.0001)	(0.0010)	(0.0307)	(0.0016)	(0.0332)	(0.0010)	(0.0335)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	154,227	1,601	1,601	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Table 8: Targets' institutional monitoring, acquirer returns and division of merger gains

The sample consists of 1,601 mergers and acquisitions announced during 1984-2011 described in Table 1. In Panel A, we estimate OLS regressions of acquirer announcement returns similar to those in Moeller, Schlingemann, and Stulz (2004) and Masulis, Wang, and Xie (2007). The dependent variable is the acquirer's cumulative abnormal return (CAR) over three days around the merger announcement date. In Panel B, we estimate OLS regressions of the relative gains of the target vs the acquirer per dollar of total market value similar to those in Ahern (2012). In both panels, the main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Acquirer returns

	Dependent variable = Acquirer CAR [-1,+1]			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	-0.0023	-0.0033	0.0025	0.0111
	(0.8689)	(0.8074)	(0.8563)	(0.4374)
Targets' institutional monitoring proxies				
Number of monitoring institutions		-0.0004***		
		(0.0015)		
Proportion of monitoring institutions			-0.1330***	
			(0.0031)	
Total ownership of monitoring institutions				-0.0504***
				(0.0019)
Acquirer characteristics				
Size	0.0000	0.0009	0.0010	0.0010
	(0.9905)	(0.3786)	(0.3644)	(0.3303)
Q	0.0000	0.0000	0.0000	0.0000
	(0.6375)	(0.6755)	(0.7072)	(0.6873)
Leverage	-0.0002	0.0003	0.0008	0.0001
	(0.9863)	(0.9792)	(0.9411)	(0.9950)
Liquidity	-0.0089**	-0.0099**	-0.0095**	-0.0097**
	(0.0425)	(0.0238)	(0.0300)	(0.0277)
OCF	-0.0055	-0.0040	-0.0042	-0.0045
	(0.6117)	(0.7085)	(0.6936)	(0.6762)
Prior year market adjusted return	0.0126***	0.0127***	0.0130***	0.0130***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Target characteristics				
Q	0.0000	0.0000	0.0000	0.0000
	(0.4887)	(0.5962)	(0.6783)	(0.6074)
Leverage	-0.0053	-0.0066	-0.0070	-0.0065
	(0.4968)	(0.3946)	(0.3691)	(0.4053)
Liquidity	-0.0040*	-0.0039*	-0.0032	-0.0033
	(0.0794)	(0.0873)	(0.1612)	(0.1537)
OCF	-0.0002	0.0015	0.0017	0.0020
	(0.9811)	(0.8725)	(0.8605)	(0.8337)
Prior year market adjusted return	0.0019	0.0019	0.0025	0.0023
	(0.3777)	(0.3576)	(0.2436)	(0.2755)
Deal and market characteristics				
Relative size (Target / Acquirer)	-0.0004	0.0000	-0.0001	0.0000
	(0.7970)	(0.9743)	(0.9653)	(0.9939)
Cash only payment (0,1)	0.0240***	0.0222***	0.0223***	0.0220***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock only payment (0,1)	-0.0052	-0.0054	-0.0052	-0.0058
	(0.2344)	(0.2128)	(0.2335)	(0.1866)
Tender offer (0,1)	0.0088*	0.0082	0.0084	0.0082

	(0.0886)	(0.1108)	(0.1007)	(0.1080)
Hostile deal (0,1)	-0.0118	-0.0096	-0.0094	-0.0086
	(0.1619)	(0.2522)	(0.2665)	(0.3076)
Competed deal (0,1)	-0.0052	-0.0033	-0.0036	-0.0038
	(0.4220)	(0.6099)	(0.5796)	(0.5561)
Toehold (0,1)	0.0012	0.0008	0.0005	0.0006
	(0.8787)	(0.9166)	(0.9498)	(0.9360)
Merger of equals (0,1)	0.0256	0.0299*	0.0284*	0.0288*
	(0.1285)	(0.0762)	(0.0912)	(0.0872)
Same industry (0,1)	0.0030	0.0031	0.0035	0.0031
	(0.5069)	(0.4934)	(0.4390)	(0.4935)
Competitive industry (0,1)	0.0052	0.0051	0.0052	0.0051
	(0.2392)	(0.2436)	(0.2309)	(0.2419)
Unique industry (0,1)	0.0077	0.0080	0.0076	0.0074
	(0.1219)	(0.1084)	(0.1280)	(0.1359)
High tech industry (0,1)	-0.0087	-0.0086	-0.0092	-0.0089
	(0.2148)	(0.2191)	(0.1875)	(0.2045)
Target industry liquidity index	-0.0178*	-0.0187**	-0.0184**	-0.0182*
	(0.0569)	(0.0449)	(0.0488)	(0.0520)
One year macroeconomic change	0.0001	0.0001	0.0002	0.0001
	(0.9207)	(0.9139)	(0.8752)	(0.9369)
Constant	-0.0073	-0.0104	-0.0118	-0.0122
	(0.7340)	(0.6283)	(0.5822)	(0.5692)
Heckman self-selectivity correction	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Panel B: Division of merger gains

	Dependent variable = Relative gain of the target vs the acquirer per dollar of total market value			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	0.0037	0.0039	0.0027	0.0013
	(0.3575)	(0.2039)	(0.3767)	(0.3377)
Targets' institutional monitoring proxies				
Number of monitoring institutions		0.0006***		
		(0.0001)		
Proportion of monitoring institutions			0.2678***	
			(0.0001)	
Total ownership of monitoring institutions				0.0892***
				(0.0001)
Other controls as in Panel A	Yes	Yes	Yes	Yes
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 9: Robustness

Panel A presents regressions of acquisition premiums on the residual of the target's institutional monitoring proxies. These residuals are retained from three (untabulated) first step regressions that use the number of monitoring institutions, the proportion of monitoring institutions, and the total ownership of monitoring institutions as the respective dependent variables. Models (1), (2), and (3) show the premium regressions where the first step tests use target's size, lagged stock return, leverage, Q, G-index, board size, board ownership, independent board (0,1), busy board (0,1), and Delaware (0,1) as independent variables. In Panel A, the sample size is reduced due to governance and director data availability from RiskMetrics. Panels B and D present OLS regressions of acquirer announcement returns similar to those in Table 8. Panel C reports four premium regressions similar to those in Panel B of Table 5. The subsample analyzed in Panels C and D consists of 1,156 deals from the original sample of 1,601 deals described in Table 1. This subsample excludes target firms operating in the Financial industry (i.e., Banking, Insurance, Real Estate and Trading). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Controlling for governance - Abnormal institutional monitoring and acquisition premiums

	Dependent variable = Acquisition premium		
	Model (1)	**Model (2)**	**Model (3)**
Number of monitoring inst $_{residual}$	0.0015*		
	(0.0603)		
Proportion of monitoring inst $_{residual}$		1.4683***	
		(0.0060)	
Ownership of monitoring inst $_{residual}$			0.3714**
			(0.0369)
Other controls as in Table 5 Panel B	Yes	Yes	Yes
N	389	389	389

Panel B: Different CAR windows - Targets' institutional monitoring and acquirer returns

	Model (1)	**Model (2)**
Dependent variable = Acquirer return alternatives	CAR [-2,+2]	CAR [-5,+5]
Institutional blockholder ownership	0.0026	-0.0093
	(0.8856)	(0.6782)
Total ownership of monitoring institutions	-0.0629***	-0.0522**
	(0.0022)	(0.0396)

Panel C: Excluding financial firms - Targets' institutional monitoring and acquisition premiums

	Dependent variable = Acquisition premium			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Institutional blockholder ownership	0.0745	0.0918	0.0573	0.0257
	(0.4275)	(0.3298)	(0.5405)	(0.7909)
Number of monitoring institutions		0.0016*		
		(0.0511)		
Proportion of monitoring institutions			1.2236***	
			(0.0012)	
Total ownership of monitoring institutions				0.2551**
				(0.0492)

Panel D: Excluding financial firms - Targets' institutional monitoring and acquirer returns

	Dependent variable = Acquirer return			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Institutional blockholder ownership	0.0047	-0.0022	0.0084	0.0173
	(0.7859)	(0.8972)	(0.6287)	(0.3299)
Number of monitoring institutions		-0.0003***		
		(0.0052)		
Proportion of monitoring institutions			-0.1532***	
			(0.0076)	
Total ownership of monitoring institutions				-0.0561***
				(0.0043)

Appendix: Variable definitions

Institutional monitoring proxies	
Number of monitoring institutions	the number of institutions whose holding value in the target is in the top 10% of their portfolio
Proportion of monitoring institutions	the proportion of monitoring institutions among all institutions holding the target's shares
Total ownership of monitoring institutions	the total ownership of monitoring institutions on the target's total shares outstanding
Traditional blockholder proxies	
Number of blockholders	the number of institutions whose ownership in the target is at least 5% of the target's shares outstanding
Proportion of blockholders	the proportion of blockholders among all institutions holding the target's shares
Total ownership of blockholders	the total ownership of blockholders on the target's total shares outstanding
Total ownership of the five largest institutions	the total share ownership controlled by the five largest institutional investors in the target
Ownership of the largest institution	the share ownership controlled by the largest institutional investor in the target
Deal characteristics	
Acquisition premium	the offer price divided by the target's stock price four weeks before the merger announcement date, as reported by SDC and limited between 0% and 200%
Combined premium	Following Officer (2003), we first estimate a premium based on "component" data using the aggregate value of cash, stock, and other securities offered by the bidder to target shareholders as reported by SDC. We then estimate premiums based on "initial price" and "final price" data, respectively. These prices are also reported by SDC. All premium measures are then deflated by the target's market value 42 trading days prior to the bid announcement. The combined premium is based on the component measure if it is greater than 0% and less than 200%; otherwise the premium relies on the initial price measure (or on the final price measure if initial price data are missing).
Target CAR	the target's cumulative abnormal return over the window around the merger announcement date, calculated as the residual from the market model estimated during the one year window ending four weeks prior to the merger announcement
Acquirer CAR	the acquirer's cumulative abnormal return over the window around the merger announcement date, calculated as the residual from the market model estimated during the one year window ending four weeks prior to the merger announcement
Division of merger gains (Target/Acquirer)	the target's gain relative to the acquirer's gain defined as target \$CAR minus acquirer \$CAR divided by the sum of acquirer and target market values 50 trading days before the merger announcement as in Ahern (2012). This division of merger gains measure represents the relative gain of the target versus the acquirer for each dollar of total market value, without the concern that total gains may be negative.
Completion (0,1)	one if the announced deal is completed
Target termination fee (0,1)	one if the target has a termination fee provision in the merger contract
Lockup (0,1)	one if the deal includes a lockup of target or acquirer shares
Prior bidding (0,1)	one if the deal follows a prior bid within one year
Toehold (0,1)	one if the bidder owns a fraction of the target's shares

Cash only payment (0,1)	one if the deal is paid entirely in cash
Stock only payment (0,1)	one if the deal is paid entirely in stock
Tender offer (0,1)	one if the form of the deal is a tender offer
Merger of equals (0,1)	one if the deal is classified by SDC as a merger of equals
Same industry (0,1)	one if both the target and the acquirer belong to the same Fama and French (1997) 48 industrial classification group
Market characteristics	
Target Herfindahl-Hirschman index	the competitiveness of the target industry. An industry's Herfindahl index is computed as the sum of squared market shares of all firms in the industry using data on sales, as in Masulis, Wang and Xie (2007).
Target industry liquidity	the liquidity of the market for corporate control for the target firms' industry. This variable is defined as the value of all corporate control transactions for US$1 million or more reported by SDC for each year and industry divided by the total book value of assets of all Compustat firms in the same industry and year, as in Schlingemann, Stulz and Walkling (2002)
One year macroeconomic change	the difference in the industrial production index over one year period before the merger
Competitive industry (0,1)	one if the bidder's industry is in the bottom quartile of all industries sorted annually by the Herfindahl index. An industry's Herfindahl index is computed as the sum of squared market shares of all firms in the industry using data on sales (as in Masulis, Wang and Xie, 2007)
Unique industry (0,1)	one if the bidder's industry is in the top quartile of all industries sorted annually by industry-median product uniqueness. Product uniqueness is defined as selling expenses scaled by sales (as in Masulis, Wang and Xie, 2007)
High tech industry (0,1)	one if bidder and target are both from high tech industries defined by Loughran and Ritter (2004)
Financial characteristics	
Size	the natural logarithm of the market value of assets
Q	the market value of assets divided by the book value of assets
Leverage	the book value of debt divided by the sum of book value of debt and market value of equity.
Liquidity	the natural logarithm of one plus the average of the daily Amihud (2002) illiquidity measure over the fiscal year, multiplied by minus one to facilitate the liquidity interpretation since a lower Amihud's value implies a higher liquidity level.
Operating cash flow	the cash flow from operations scaled by the value of assets
Prior year market adjusted return	the cumulative abnormal return during the one year window ending four weeks prior to the merger announcement, calculated as the residual from the market model estimated during the year before
Governance characteristics	
G index	the sum of 24 antitakeover provisions tracked by RiskMetrics as in Gompers, Ishii, and Metrick (2003)
Board size	the natural logarithm of the number of directors on the board
Board ownership	the equity owned by all directors (excluding the CEO) as a proportion of the firm's shares outstanding
Independent board (0,1)	one if at least half of the board's directors are independent. A director is considered independent if s/he is not a current or former employee of the firm or a subsidiary, and is not affiliated with the company as defined by RiskMetrics.
Busy board (0,1)	one if at least 50% of outside directors hold three or more directorships

Delaware (0,1)	one if the company is incorporated in the state of Delaware
Russell index inclusion of target	
Russell 1000 $_{t-1}$ → Russell 2000 $_{t}$	one if the target firm moves from the Russell 1000 to the Russell 2000
Russell 2000 $_{t-1}$ → No index $_{t}$	one if the target firm moves out of the Russell 2000 to below the top 3000
Russell 2000 $_{t-1}$ → Russell 1000 $_{t}$	one if the target firm moves from the Russell 2000 to the Russell 1000
No index $_{t-1}$ → Russell 2000 $_{t}$	one if the target firm moves to the Russell 2000 from below the top 3000
Change in ranking in Russell $_{(t-1,\,t)}$	change in the target firm's ranking in the Russell from time *t*-1 to *t*
Other variables	
Heckman self-selectivity	the Heckman (1979) lambda obtained from a two stage estimation process. In the first-stage, we estimate the probability of becoming a target. In the second stage, the inverse Mill's ratio from the first stage model is included in the estimation as a variable to control for self-selection.